SAF-RC-232 100-IU-2 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Kathy Wendt H4-21

KW 5/4/15 INITIAL/DATE

COMMENTS:

SDG JP0934 SAF-RC-232

Sample Location: 100-B-35:1

Date:

27 April 2015

To:

Washington Closure Hanford Inc. (technical representative)

From:

ELR Consulting

Project:

100-IU-2 & 100-IU-6 Remaining Waste Sites - Soil Full Protocol - Waste

Subsite 100-B-35:1

Subject:

Diesel Range Organic - Data Package No. JP0934-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0934 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V4X9	3/30/15	Soil	С	See note 1
J1V501	3/30/15	Soil	С	See note 1
J1V502	3/30/15	Soil	С	See note 1
J1V503	3/30/15	Soil	С	See note 1
J1V504	3/30/15	Soil	С	See note 1
J1V505	3/30/15	Soil	С	See note 1
J1V506	3/30/15	Soil	С	See note 1
J1V507	3/30/15	Soil	С	See note 1
J1V508	3/30/15	Soil	С	See note 1
J1V509	3/30/15	Soil	С	See note 1
J1V510	3/30/15	Soil	С	See note 1

^{1 -} Diesel range organics by 8015B.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Data Requested by Client

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

Method Blanks

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

Field Blanks

No field blank was submitted for analysis.

Accuracy

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in

duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

Completeness

Data package No. JP0934 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, September 2009.

Appendix 1 Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.
- Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The
 data may not be valid for some specific applications (i.e., usable for decisionmaking purposes).
- N Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

DIESEL RANGE ORGANIC DATA QUALIFICATION SUMMARY*

SDG: JP0934	REVIEWER: ELR	Project: 100-B-35:1	PAGE_1_OF_1
COMMENTS: No qualifiers a	ssigned		

^{* -} The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3 Annotated Laboratory Reports

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V4X9

Lab Sample ID:

280-67225-1

Client Matrix:

Solid

% Moisture:

7.5

Date Sampled: 03/30/2015 0950

Date Received: 04/01/2015 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:

NWTPH-Dx

Analysis Batch:

280-271015

Instrument ID:

SGC_U2a

Prep Method: Dilution:

3550C

Prep Batch:

04030008.D

1.0

280-270791

Lab File ID:

Analysis Date:

Initial Weight/Volume:

30.2 g

Prep Date:

04/03/2015 1204

Final Weight/Volume: Injection Volume:

1 mL 1 uL

04/01/2015 2245

Result (ug/Kg)

Qualifier

MDL 1100 730

RL 4300

4300

Analyte C10-C36 C10-C28 DryWt Corrected: Y

11000 6300

Acceptance Limits

Surrogate o-Terphenyl

%Rec 69

Qualifier

49 - 115

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V500

Lab Sample ID:

280-67225-2

Client Matrix:

Solid

% Moisture:

4.2

Date Sampled: 03/30/2015 0956

Date Received: 04/01/2015 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:

NWTPH-Dx

Analysis Batch:

280-271015

Instrument ID:

SGC_U2a

Prep Method:

3550C

Prep Batch:

Lab File ID:

Dilution:

1.0

280-270791

Initial Weight/Volume:

04030011.D

Analysis Date:

04/03/2015 1319

Final Weight/Volume:

30.1 g 1 mL

04/01/2015 2245

Injection Volume:

1 uL

Analyte C10-C36 C10-C28

Prep Date:

DryWt Corrected: Y

Result (ug/Kg) 5100 4100

Qualifier MDL 1000 710

RL4200 4200

Surrogate

%Rec

Qualifier

J

Acceptance Limits

o-Terphenyl

70

49 - 115

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V501

Client: Washington Closure Hanford

Lab Sample ID:

280-67225-3

Client Matrix:

Solid

% Moisture:

5.4

Date Sampled: 03/30/2015 1000

Date Received: 04/01/2015 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:

NWTPH-Dx

Analysis Batch:

280-271015

Instrument ID:

SGC U2a

Prep Method:

3550C 1.0

Prep Batch:

280-270791

Lab File ID:

Dilution:

Initial Weight/Volume:

04030012.D

Analysis Date:

Prep Date:

04/03/2015 1346 04/01/2015 2245 Final Weight/Volume:

30.1 g 1 mL

Injection Volume:

1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		3700	J	1100	4200
C10-C28		2900	J	710	4200

Acceptance Limits Qualifier %Rec Surrogate 49 - 115 69 o-Terphenyl

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V502

Lab Sample ID:

280-67225-4

Client Matrix:

Solid

% Moisture:

9.8

Date Sampled: 03/30/2015 0902

Date Received: 04/01/2015 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:

NWTPH-Dx

Analysis Batch:

280-271015

Instrument ID:

SGC_U2a

Prep Method:

3550C

Prep Batch:

280-270791

Lab File ID:

Dilution:

1.0

04030013.D

Analysis Date:

Initial Weight/Volume:

30.5 g

04/03/2015 1410

Final Weight/Volume:

MDL.

1100

740

1 mL

Prep Date:

04/01/2015 2245

Injection Volume:

1 uL

Analyte C10-C36 DryWt Corrected: Y

Result (ug/Kg) 12000 11000

Qualifier

RL 4400 4400

C10-C28 Surrogate

%Rec

Qualifier

Acceptance Limits

o-Terphenyl

75

49 - 115

~ y/whis

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V503

Lab Sample ID:

280-67225-5

Client Matrix:

Solid

% Moisture:

7.0

Date Sampled: 03/30/2015 0933

Date Received: 04/01/2015 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:

NWTPH-Dx

Analysis Batch:

280-271015

Instrument ID:

SGC_U2a

Prep Method: Dilution: Analysis Date: 3550C 1.0

Prep Batch:

280-270791

Lab File ID:

04030014.D

04/03/2015 1434

04/01/2015 2245

Initial Weight/Volume: Final Weight/Volume:

30.1 g 1 mL

Injection Volume:

1 uL

Analyte

Prep Date:

DryWt Corrected: Y

Result (ug/Kg)

Qualifier

MDL 1100 730

RL 4300 4300

C10-C36 C10-C28

6600 5100

Qualifier

Acceptance Limits

Surrogate o-Terphenyi %Rec 73

49 - 115

W4/10/6

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V504

Lab Sample ID:

280-67225-6

Client Matrix:

Solid

% Moisture:

4.8

Date Sampled: 03/30/2015 0927

Date Received: 04/01/2015 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:

NWTPH-Dx

Analysis Batch:

280-271310

Instrument ID:

SGC_U2a

Prep Method: Analysis Date: 3550C

Prep Batch:

280-270791

Dilution:

1.0

Lab File ID:

04060007.D

Initial Weight/Volume: Final Weight/Volume: 30.7 g

Injection Volume:

1 mL

1 uL

Analyte C10-C36 C10-C28

04/01/2015 2245 DryWt Corrected: Y

04/06/2015 1427

Result (ug/Kg) 4100

Qualifier

MDL 1000 700

RL 4100 4100

Surrogate o-Terphenyl

Prep Date:

%Rec 74

2800

Qualifier

J

Acceptance Limits

49 - 115

Valuelis

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V505

Lab Sample ID:

280-67225-7

Client Matrix:

Solid

% Moisture:

7.2

Date Sampled: 03/30/2015 0858

Date Received: 04/01/2015 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:

NWTPH-Dx

04/01/2015 2245

Analysis Batch:

280-271310

Instrument ID:

SGC_U2a

Prep Method:

3550C

Prep Batch:

Lab File ID:

Dilution:

1.0

280-270791

04060008.D

Analysis Date: Prep Date:

04/06/2015 1451

Initial Weight/Volume:

30.4 g

Final Weight/Volume:

MDL

1100

720

1 mL

Injection Volume:

1 uL

Analyte C10-C36 DryWt Corrected: Y

Result (ug/Kg) 13000

Qualifier

RL 4300 4300

C10-C28

11000

Qualifier

Acceptance Limits

Surrogate o-Terphenyl %Rec 74

49 - 115

Valido

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V508

Lab Sample ID:

280-67225-8

Client Matrix:

Solid

% Moisture:

3.9

Date Sampled: 03/30/2015 0849

Date Received: 04/01/2015 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:

NWTPH-Dx

Analysis Batch:

280-271310

Instrument ID:

SGC_U2a

Prep Method: Dilution:

3550C

Prep Batch:

280-270791

Lab File ID:

1.0

04060009.D

Analysis Date:

Initial Weight/Volume:

30.1 g

04/06/2015 1516

Final Weight/Volume: Injection Volume:

700

1 mL 1 uL

Prep Date: Analyte

04/01/2015 2245

Result (ug/Kg) 25000

Qualifier MDL 1000 RL 4200 4200

C10-C36 C10-C28 DryWt Corrected: Y

20000

Qualifier

Acceptance Limits

Surrogate o-Terphenyl %Rec 75

49 - 115

My (calos

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V507

Lab Sample ID:

280-67225-9

Client Matrix:

Solid

% Moisture:

4.9

Date Sampled: 03/30/2015 0909

Date Received: 04/01/2015 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:

NWTPH-Dx

Analysis Batch:

280-271310

Instrument ID:

SGC_U2a

Prep Method:

3550C

Prep Batch: 280-270791

Lab File ID:

04060006.D

Dilution:

1.0

04/06/2015 1400

DryWt Corrected: Y

Initial Weight/Volume:

30.1 g

Final Weight/Volume:

1 mL

Analysis Date:

Injection Volume:

1 uL

Prep Date:

04/01/2015 2245

Result (ug/Kg) 3600 2700

Qualifier

MDL 1000 710

RL 4200 4200

Surrogate o-Terphenyl

Analyte

C10-C36

C10-C28

%Rec

49

Qualifier

Acceptance Limits

49 - 115

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V508

Lab Sample ID:

280-67225-10

Client Matrix:

Solid

% Moisture:

9.2

Date Sampled: 03/30/2015 0905

Date Received: 04/01/2015 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:

NWTPH-Dx

Analysis Batch:

280-271310

instrument ID:

SGC_U2a

Prep Method: Dilution:

3550C 1.0

Prep Batch:

280-270791

Lab File ID:

04060010.D

Initial Weight/Volume:

04/06/2015 1542

Final Weight/Volume:

30.2 g 1 mL

Analysis Date: Prep Date:

04/01/2015 2245

Injection Volume:

1 uL

Analyte C10-C36 C10-C28 DryWt Corrected: Y

Result (ug/Kg) 4200 3000

Qualifier MDL 1100 740

RL 4400 4400

Surrogate o-Terphenyl

%Rec 72

Qualifier

J

J

Acceptance Limits 49 - 115

V4/(0/15

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V509

Lab Sample ID:

280-67225-11

Client Matrix:

Solid

% Moisture:

4.7

Date Sampled: 03/30/2015 0915

Date Received: 04/01/2015 0940

Analysis Method:

NWTPH-Dx

Analysis Batch:

280-271310

Instrument ID:

SGC_U2a

Prep Method: Dilution:

Prep Date:

3550C

Prep Batch:

Lab File ID:

Analysis Date:

1.0

280-270791

Initial Weight/Volume:

MDL

700

04060011.D

04/06/2015 1606 04/01/2015 2245 Final Weight/Volume: Injection Volume:

30.4 g

1 mL 1 uL

Analyte	DryWt Corrected:
C10-C36	

Result (ug/Kg) 5000 3300

RL 1000 4100 4100

Surrogate o-Terphenyl

C10-C28

%Rec

Qualifier

Qualifier

Acceptance Limits

73

49 - 115

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V510

Lab Sample ID:

280-67225-12

Client Matrix:

Solid

% Moisture:

6.3

Date Sampled: 03/30/2015 0922

Date Received: 04/01/2015 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:

NWTPH-Dx

04/01/2015 2245

Analysis Batch:

280-271310

Instrument ID:

SGC_U2a

Prep Method:

3550C

Prep Batch:

Lab File ID:

Dilution: Analysis Date:

Prep Date:

1.0

04/06/2015 1632

280-270791

Initial Weight/Volume:

04060012.D 30.1 g

Final Weight/Volume:

1 mL

Injection Volume:

1 uL

Analyte DryWt Corrected: Y C10-C36 C10-C28

Result (ug/Kg) 5600 3100

MDL Qualifier 1100 720

RL 4300 4300

Surrogate o-Terphenyl

%Rec 76

Qualifier

J

Acceptance Limits

49 - 115

Vylalo

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-67225-1

SDG #: JP0934 SAF#: RC-232

Date SDG Closed: April 1, 2015
Data Deliverable: 7 Day / Summary

CLIENT ID	LABID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1V4X9	280-67225-1	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V500	280-67225-2	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V501	280-67225-3	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V502	280-67225-4	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V503	280-67225-5	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V504	280-67225-8	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V505	280-67225-7	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V506	280-67225-8	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V507	280-67225-9	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V508	280-67225-10	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V509	280-67225-11	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V510	280-67225-12	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 4/1/2015 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 2.1° C, 3.3° C and 4.1° C.

The samples presented in this report contained large rocks that were not included in the aliquots used for extraction and/or analysis.

GC SEMIVOLATILES - SW846 8082 - PCBs

The laboratory noted that a Sulfuric Acid clean-up was performed on the samples presented in this report to reduce matrix interferences.

Sample J1V506 contained a combination of Aroclor 1254 and Aroclor 1260 with insufficient separation to quantify individually. The sample has been quantified and reported as the predominant Aroclor. Due to the shared peaks of these two Aroclors, there is increased qualitative and quantitative uncertainty associated with these results.

No other anomalies were encountered.

GC SEMIVOLATILES - NWTPH-Dx - DRO

No anomalies were encountered.

HPLC - SW846 8310 - PAHs

The RPD between the primary and confirmation columns exceeded 40% for Benzo[a]anthracene in samples J1V4X9, J1V501, J1V502 and J1V506. The lower of the two values has been reported, as matrix interference is evident on both columns. Associated results have been flagged with an "X".

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-270827 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

Low levels of Chromium are present in the method blank associated with batch 280-270827. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V4X9; therefore, control limits are not applicable.

The duplicate analysis of sample J1V4X9 exhibited RPD data outside the control limits for Barium, Boron and Mercury, and the associated sample results have been flagged "M". There is no indication that the analytical systems were operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

Washington Closure Hanford	GIOSURE MANIO		CHAIN OF GUS! ODY/SAMPLE ANAL	CITTO	AMIT	FANE		YSIS REQUEST	RC-232-091	
STOWE QG		dîn	mpany Contact Joan Kessner	1ele 375	Telephone No.			Project Coordinator KESSNER, JH	Price Code	Data Tumeround
reject Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites	aaming Waste Sites	Samplin 100-	mpling Location 100-B-35-1 (shallow zone, ver)				50	RC-232	88	7 00
a Chaes No. RCC-	Rcc-08-022	EL-1	id Logbook No. EL-1667-03		COA 0108352000	00		Commercial Carrier	12 Pag 2	
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Appendix 5

Data Validation Supporting Documentation

VALIDATION LEVEL:	A	В	(c)	D	E
PROJECT:	100-3-3	5:1	DATA PACKA	GE: 14093	
VALIDATOR:	LIDATOR: ECR LAB: TA		tc	DATE: 4	52/12
			SDG:	JP0934	
		ANALYSES	PERFORMED		
8015	8021	8141	8151	8315	
		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MAT	RIX:				
210489	Jlusco	JIVSOL			vsoy
	Jlusor			110504 1	LUSIO
	ACKAGE COMP	LETENESS AND	CASE NARRAT		Suil
	ACKAGE COMP		CASE NARRAT		\wedge
Comments: INSTRU Initial calibrations Continuing calibra	ACKAGE COMP ion documentation MENT TUNING acceptable?	LETENESS AND present?	CASE NARRAT	d E)	Yes No
Comments: INSTRUE Initial calibrations Continuing calibra Standards traceable	ACKAGE COMP ion documentation MENT TUNING acceptable? tions acceptable?	PLETENESS AND present?	CASE NARRAT	d E)	Yes No
Comments: INSTRU Initial calibrations Continuing calibra Standards traceable Standards expired	MENT TUNING acceptable?	LETENESS AND present?	CASE NARRAT	d E)	Yes No

3. BLANKS (Levels B, C, D, and E)				_
Calibration blanks analyzed? (Levels D, E)	•••••		Yes	No MI
Calibration blank results acceptable? (Levels D, E)		***************************************	Y99	No N/
Laboratory blanks analyzed?	***************************************	•••••	(Yes)	No N/A
Laboratory blank results acceptable?		•••••	Yes	Ne N/A
Field/trip blanks analyzed? (Levels C, D, E)			Yes($(N_0)_{N_{\perp}}$
Field/trip blank results acceptable? (Levels C, D, E)	***************************************		Yes	No N/A
Transcription/calculation errors? (Levels D, E)	***************************************	*******	Yes	No (N/
Comments:	No	FR		
4. ACCURACY (Levels C, D, and E)				e de la companio de l
Surrogates/system monitoring compounds analyzed?			X X	No N/
Surrogate/system monitoring compound recoveries acceptable?				No N
Surrogates traceable? (Levels D, E)				No (N/
Surrogates expired? (Levels D, E)				No W/
MS/MSD samples analyzed?				No N/
MS/MSD results acceptable?		•••••	X.Ye	No N
MS/MSD standards NIST traceable? (Levels D, E)	••••••		Yes	NO NA
MS/MSD standards expired? (Levels D, E)		•••••	XES	No (N/
LCS/BSS samples analyzed?		•••••	('yet	No N/A
LCS/BSS results acceptable?	•••••		(. Yes)	No M
Standards traceable? (Levels D, E)	•••••	•••••	Yes	No ()
Standards expired? (Levels D, E)	•••••		Yes	No (N/
Transcription/calculation errors? (Levels D, E)	•••••		Yes	No W
Performance audit sample(s) analyzed?				/~
Performance audit sample results acceptable?				ノハ
Comments:				
		No	PAP	
				·· ·

5.	PRECISION (Levels C, D, and E)	
Duplic	cate RPD values acceptable?	
Duplic	cate results acceptable?	
MS/M	(SD standards NIST traceable? (Levels D, E)	Yes No N/A
MS/M	(SD standards expired? (Levels D, E)	Yes No NA
Field d	duplicate RPD values acceptable?	Yes No (N/A
Field s	split RPD values acceptable?	Yes No (N/A)
Transc	cription/calculation errors? (Levels D, E)	Yes No (N/A)
	nents:	
,		
-		
6.	HOLDING TIMES (all levels)	
Sampl	les properly preserved?	Yes No N/A
Sampl	le holding times acceptable?	Yes No N/A
Comm	nents:	
		

8. COMPOUND IDENTIFICATION, QUANTITATION, AND	DETECTION LIMITS (all
levels)	\bigcirc
Results reported for all requested analyses?	(Yes)No)\/A
Results supported in the raw data? (Levels D, E)	Yes No N/
Samples properly prepared? (Levels D, E)	Yes No W
Detection limits meet RDL?	
Transcription/calculation errors? (Levels D, E)	Yes No N/z)
Comments:	
9. SAMPLE CLEANUP (Levels D and E)	
Fluoricil ® (or other aborbant) cleanup performed?	Yes/Nø N/A
Lot check performed?	Yes No N/A
Check recoveries aceptable?	Yes No N/A
Check materials traceable?	Yes No N/A
Check materials Expired?	Yes No N/A
Analytical batch QC given similar cleanup?	Yes No N/A
Transcription/Calculation Errors?	Yes No N/A
Comments:	

Appendix 6

Additional Documentation Requested by Client

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Method Blank - Batch: 280-270791

Method: NWTPH-Dx Preparation: 3550C

Lab Sample ID:

MB 280-270791/1-A

Analysis Batch:

280-271015

Instrument ID:

SGC_U2a

Client Matrix: Dilution:

Solid 1.0

Prep Batch: Leach Batch:

Units:

280-270791

Lab File ID: Initial Weight/Volume: 04030005.D

Analysis Date:

04/03/2015 1051

NΑ ug/Kg

Final Weight/Volume:

31.2 g 1 mL

Prep Date: Leach Date: 04/01/2015 2245

Injection Volume:

1 uL

Analyte	Result	Qual	MDL	RL
C10-C36	960	U	960	3800
C10-C28	6 5 0	r	650	3800

Surrogate o-Terphenyl % Rec

Acceptance Limits

72

49 - 115

Lab Control Sample/

Lab Control Sample Duplicate Recovery Report - Batch: 280-270791

Method: NWTPH-Dx Preparation: 3550C

LCS Lab Sample ID:

Solid

LCS 280-270791/2-A Analysis Batch:

Units:

280-271015

Instrument ID:

SGC_U2a

Client Matrix: Dilution:

1.0

Prep Batch: Leach Batch: 280-270791

Lab File ID:

04030008.D

Analysis Date:

04/03/2015 1115

N/A ug/Kg Initial Weight/Volume: Final Weight/Volume:

Injection Volume:

30.8 g 1 mL

1 uL

Prep Date: Leach Date: 04/01/2015 2245

Analysis Batch:

280-271015

Instrument ID:

SGC_U2a

Client Matrix: Dilution:

LCSD Lab Sample ID: LCSD 280-270791/3-A Solid

Prep Batch:

280-270791

Lab File ID:

04030007.D

Analysis Date:

04/03/2015 1140

Leach Batch:

N/A

Initial Weight/Volume: Final Weight/Volume:

30.9 g 1 mL

Prep Date:

04/01/2015 2245

Units:

LCS

83

82

ug/Kg

Leach Date:

N/A

% Rec. LCSD

Injection Volume:

1 uL

Analyte

82 81

57 - 115 53 - 115

Limit

RPD RPD Limit 23 23

LCSD Qual LCS Qual

Surrogate o-Terphenyl

C10-C36

C10-C28

LCS % Rec 69

LCSD % Rec 69

1

1

Acceptance Limits 49 - 115

Quality Control Results

Job Number: 280-67225-1

Sdg Number: JP0934

Laboratory Control/

Client: Washington Closure Hanford

Laboratory Duplicate Data Report - Batch: 280-270791

Method: NWTPH-Dx

Preparation: 3550C

LCS Lab Sample ID:

LCS 280-270791/2-A

Units: ug/Kg

LCSD Lab Sample ID:

LCSD 280-270791/3-A

Client Matrix:

Solid

Client Matrix:

Solid 1.0

Dilution:

1.0

Dilution: Analysis Date:

04/03/2015 1140

Analysis Date:

04/03/2015 1115 04/01/2015 2245

Prep Date:

04/01/2015 2245

Prep Date: Leach Date:

N/A

Leach Date:

N/A

Analyte	LCS Spike	LCSD Spike	LCS	LCSD
	Amount	Amount	Result/Qual	Result/Qual
C10-C36	64900	64700	53600	53100
C10-C28	64900	64700	53300	52800

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 280-270791

Method: NWTPH-Dx

Preparation: 3550C

MS Lab Sample ID:

280-67225-1

Analysis Batch:

280-271015

Instrument ID:

SGC_U2a

Client Matrix:

Solid

Prep Batch:

280-270791

Lab File ID:

Dilution:

1.0

Leach Batch:

N/A

Initial Weight/Volume:

04030009.D 30.5 g

Analysis Date: Prep Date:

04/03/2015 1230 04/01/2015 2245

Final Weight/Volume: Injection Volume:

1 mL 1 uL

Leach Date:

MSD Lab Sample ID:

N/A

Anatysis Batch:

280-271015

Instrument ID:

SGC_U2a

Client Matrix: Dilution:

Solid 1.0

Prep Batch: Leach Batch: 280-270791

N/A

Lab File ID:

04030010.D 30.5 g

Analysis Date:

04/03/2015 1254

280-67225-1

Initial Weight/Volume: Final Weight/Volume:

1 mL

Prep Date:

04/01/2015 2245

Injection Volume:

1 uL

Leach Date: N/A

Analyte	MS MS	Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
C10-C36	84	83	57 - 115	0	23		
C10-C28	83	84	56 - 115	0	23		
Surrogate		MS % Rec	MSD 9	6 Rec	Acceptance Limits		3
o-Terphenyl		71	72		4	49 - 115	

Quality Control Results

Job Number: 280-67225-1

Sdg Number: JP0934

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 280-270791

Method: NWTPH-Dx

Preparation: 3550C

MS Lab Sample ID:

280-67225-1

MSD Lab Sample ID:

280-67225-1

Client Matrix:

Solid

Client Matrix:

Solid

Dilution:

1.0

Client: Washington Closure Hanford

Dilution:

1.0

Analysis Date:

04/03/2015 1230

Analysis Date:

04/03/2015 1254 04/01/2015 2245

Prep Date: Leach Date: 04/01/2015 2245

Prep Date: Leach Date:

N/A

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual	
C10-C36	11000	70900	70900	70000	69800	
C10-C28	6300	70900	70900	65400	65500	

Units: ug/Kg

Date:

27 April 2015

To:

Washington Closure Hanford Inc. (technical representative)

From:

ELR Consulting

Project:

100-IU-2 & 100-IU-6 Remaining Waste Sites - Soil Full Protocol - Waste

Subsite 100-B-35:1

Subject:

Inorganic - Data Package No. JP0934-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0934 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V4X9	3/30/15	Soil	С	See note 1
J1V501	3/30/15	Soil	С	See note 1
J1V502	3/30/15	Soil	С	See note 1
J1V503	3/30/15	Soil	С	See note 1
J1V504	3/30/15	Soil	С	See note 1
J1V505	3/30/15	Soil	С	See note 1
J1V506	3/30/15	Soil	C	See note 1
J1V507	3/30/15	Soil	С	See note 1
J1V508	3/30/15	Soil	С	See note 1
J1V509	3/30/15	Soil	С	See note 1
J1V510	3/30/15	Soil	С	See note 1

^{1 -} ICP metals (6010B).

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 6 months for ICP metals and 28 days for mercury.

All holding times were acceptable.

· Preparation (Method) Blanks

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "UJ". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

Accuracy

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 75% to 125%. Samples with a recovery of less than 30%

and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 74% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 125% and a sample result less than the IDL, no qualification is required.

Due to matrix spike recoveries outside QC limits, all antimony (48%), calcium (68%) and silicon (28%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits, all silicon (11%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable

Precision

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD outside QC limits, all barium (42%) results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

Analytical Detection Levels

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

Completeness

Data package No. JP0934 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to matrix spike recoveries outside QC limits, all antimony (48%), calcium (68%) and silicon (28%) results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits, all silicon (11%) results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits, all barium (42%) results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*. March 2008.

DOE/RL-96-22, Rev. 5, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, September 2009.

Appendix 1 Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

INORGANIC DATA QUALIFICATION SUMMARY*

SDG: JP0934	REVIEWER: ELR	Project: 100-B-35:1	PAGE_1_OF_1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Silicon	J	All	LCS recovery
Antimony Calcium Silicon	J	All	MS recovery
Barium	J	All	RPD

^{* -} The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V4X9

Client: Washington Closure Hanford

Lab Sample ID:

280-67225-1

Client Matrix:

Solid

% Moisture:

7.5

Date Sampled: 03/30/2015 0950

Date Received: 04/01/2015 0940

6010B Metals (ICP)

Analysis Method:

6010B

Analysis Batch:

280-271290

Instrument ID:

MT_026

Prep Method:

3050B

280-270827

Lab File ID:

26b040315.asc

Dilution:

1.0

Prep Batch:

Initial Weight/Volume:

1.02 g

Analysis Date: Prep Date:

04/03/2015 1507 04/02/2015 1430 Myleulu

Final Weight/Volume:

100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7630	X	1.6	5.3
Апатопу		1.3	I	0.40	0.64
Arsenic		4.5		0.70	1.1
Barium		86.0	L MX	0.081	0.53
Beryllium		0.035	U	0.035	0.21
Boron		2.0	B M	1.0	2.1
Cadmium		0.18	В	0.043	0.21
Calcium		9830	XI	14.9	53.0
Chromium		8.4	X	0.061	0.21
Cobalt		9.6	Χ	0.11	1.1
Copper		19.9		0.23	1.1
Iron		24300	Х	4.0	5.3
Lead		6.8		0.29	0.53
Magnesium		4920	Х	3.9	21.2
Manganese		349	X	0.11	1,1
Molybdenum		0.37	В	0.28	2.1
Nickel		11.9	Х	0.13	4.2
Potassium		1240		43.4	318
Selenium		0.91	U_	0.91	1.1
Silicon		517	J	6.0	10.6
Silver		0.17	U	0.17	0.21
Sodium		299		62.5	127
Vanadium		59.4		0.10	2.1
Zinc		112	Χ	0.42	1.1

7471A Mercury (CVAA)

Analysis Method: Prep Method:

7471A 7471A

Analysis Batch: Prep Batch:

280-271101 280-271051 Instrument ID: Lab File ID:

MT_033 150403aa.txt

Dilution: Analysis Date: 1.0

04/03/2015 1532

Prep Date:

04/03/2015 1340

Initial Weight/Volume: Final Weight/Volume: 0.53 g 50 mL

Analyte Mercury DryWt Corrected: Y

Result (mg/Kg) 0.015

Qualifier вм

MDL 0.0068 RL 0.021

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V500

Lab Sample ID:

280-67225-2

04/02/2015 1430

Client Matrix:

Solid

% Moisture:

4.2

Date Sampled: 03/30/2015 0956

Date Received: 04/01/2015 0940

20400	Madala	CON
00100	Metals	(ICP)

Analysis Method:

6010B 3050B Analysis Batch:

280-271290

Instrument ID:

MT 026

Prep Method: Dilution:

1.0

Prep Batch:

280-270827

Lab File ID: Initial Weight/Volume: 26b040315.asc

Analysis Date: Prep Date:

04/03/2015 1517

V-1/20/15

Final Weight/Volume:

1.11 g 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6600	X	1.5	4.7
Antimony		0.50	вЈ	0.36	0.56
Arsenic		5.2		0.62	0.94
Barium		39.8	×J	0.071	0.47
Beryllium		0.031	U	0.031	0.19
Boron	×	0.92	U	0.92	1.9
Cadmium		0.15	В	0.039	0.19
Calcium		12000	×J	13.3	47.0
Chromium		6.7	x —	0.055	0.19
Cobalt		8.5	X	0.094	0.94
Copper		16.7		0.20	0.94
Iron		22300	X	3.6	4.7
Lead		4.9		0.25	0.47
Magnesium		5590	X	3.5	18.8
Manganese		283	X	0.094	0.94
Molybdenum		0.24	В	0.24	1.9
Nickel		10.1	Χ	0.12	3.8
Potassium		1280		38.6	282
Selenium		0.81	U_	0.81	0.94
Silicon		385	7	5.3	9.4
Silver		0.15	U	0.15	0.19
Sodium		262		55.5	113
√anadium	•	49.3		0.088	1.9
Zinc	•	42.3	X	0.37	0.94

7471A Mercury (CVAA)

Analysis Method: Prep Method:

7471A 7471A

Analysis Batch: Prep Batch:

280-271101 280-271051

instrument ID: Lab File ID:

MT_033 150403aa.txt

Dilution: Analysis Date:

04/03/2015 1544

Initial Weight/Volume: Final Weight/Volume:

0.50 g 50 mL

Prep Date:

04/03/2015 1340

DryWt Corrected: Y

Result (mg/Kg) 0.0069

Qualifier

MDL

RL

Mercury

Analyte

0.0069

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V501

Lab Sample ID:

280-67225-3

Client Matrix:

Solid

% Moisture:

5.4

Date Sampled: 03/30/2015 1000

Date Received: 04/01/2015 0940

0A46B	Metals	/I/C/DN
	BODING.	TILL PI

Analysis Method:

6010B

Analysis Batch:

280-271290

Instrument ID:

MT_026

Prep Method: Dilution:

3050B

Prep Batch:

280-270827

Lab File ID:

26b040315.asc

Analysis Date:

1.0

04/03/2015 1520

Initial Weight/Volume: Final Weight/Volume: 1.12 g 100 mL

Pre	эp	Date	e:	

04/02/2015 1430

r-1126/15

		• •			-	
Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL	
Aluminum		7270	Ť.	1.5	4.7	
Antimony		1.2	7	0.36	0.57	
Arsenic		3.8		0.62	0.94	
Barium		59.6	×Т	0.072	0.47	
Beryllium		0.031	U	0.031	0.19	
Boron		0.93	U	0.93	1.9	
Cadmium		0.13	В	0.039	0.19	
Calcium		7150	x I	13.3	47.2	
Chromium		7.4	Х	0.055	0.19	
Cobalt		9.3	X	0.094	0.94	
Copper		16.7		0.20	0.94	
Iron		26000	Х	3.6	4.7	
Lead		5.1		0.25	0.47	
Magnesium		5660	X	3.5	18.9	
Manganese		386	X	0.094	0.94	
Molybdenum		0.25	U	0.25	1.9	
Nickel		12.3	×	0.12	3.8	
Potassium		1180		38.7	283	
Selenium		0.81	5	0.81	0.94	
Silicon		503	7	5.3	9.4	
Silver		0.15	U	0.15	0.19	
Sodium		297		55.7	113	
Vanadium		65.7		0.089	1.9	
Zinc		48.3	Χ	0.38	0.94	

7471A Mercury (CVAA)

Analysis Method: Prep Method:

7471A

7471A

Analysis Batch: Prep Batch:

280-271101 280-271051 Instrument ID: Lab File ID:

MT_033 150403aa.txt

Dilution: Analysis Date: 1.0

04/03/2015 1546

Initial Weight/Volume: Final Weight/Volume:

0.52 g 50 mL

Prep Date:

04/03/2015 1340

DryWt Corrected: Y

Result (mg/Kg)

Qualifier

MDL 0.0067 RL

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V502

Client: Washington Closure Hanford

Lab Sample ID:

280-67225-4

Client Matrix:

04/02/2015 1430

Solid

% Moisture:

9.8

Date Sampled: 03/30/2015 0902

Date Received: 04/01/2015 0940

6010B Metals (ICP)

Analysis Method:

6010B

Analysis Batch:

280-271290

Instrument ID:

MT_026

Prep Method:

3050B

Prep Batch:

280-270827

Lab File ID:

26b040315.asc

Dilution: Analysis Date: Prep Date:

1.0 04/03/2015 1523

My (26/15

Initial Weight/Volume: Final Weight/Volume: 1.13 g 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		10900	Ĵ	1.5	4.9
Antimony		0.79	J	0.37	0.59
Arsenic		7.1		0.65	0.98
Barium		57.4	×J	0.075	0.49
Beryllium		0.19	В	0.032	0.20
Boron		1.4	В	0.96	2.0
Cadmium		0.15	В _	0.040	0.20
Calcium		11400	$\mathcal{L}x$	13.8	49.1
Chromium		11.2	Х	0.057	0.20
Cobalt		9.4	Χ	0.098	0.98
Copper		20.8		0.21	0.98
Iron		24000	Х	3.7	4.9
Lead		8.7		0.26	0.49
Magnesium		7210	X	3.6	19.6
Manganese		410	X	0.098	0.98
Molybdenum		0.26	U	0.26	2.0
Nickel		14.9	Х	0.12	3.9
Potassium		1920		40.2	294
Selenium		0.84	U	0.84	0.98
Silicon		772	J	5.6	9.8
Silver		0.16	Ú	0.16	0.20
Sodium		305	_	57.9	118
Vanadium		47.8		0.092	2.0
Zinc		50.4	Х	0.39	0.98

7471A Mercury (CVAA)

Analysis Method: Prep Method:

7471A 7471A

Prep Batch:

Analysis Batch: 280-271101 280-271051

Instrument ID: Lab File ID:

MT_033 150403aa.txt

Dilution: Analysis Date: 1.0 04/03/2015 1549

Initial Weight/Volume:

0.57 g 50 mL

Prep Date:

04/03/2015 1340

Final Weight/Volume:

Analyte Mercury DryWt Corrected: Y

Result (mg/Kg) 0.0065

Qualifier

MDL 0.0065 RL 0.020

Job Number: 280-67225-1 Client: Washington Closure Hanford

Sdg Number: JP0934

Client Sample ID:

J1V503

Lab Sample ID:

280-67225-5

Client Matrix:

Solid

% Moisture:

7.0

Date Sampled: 03/30/2015 0933

Date Received: 04/01/2015 0940

RA1AR	Motals	(ICP)
<i></i>	WAR THE STATE OF	wri

Analysis Method:

6010B 3050B Analysis Batch:

280-271290

Instrument ID:

MT_026

Prep Method: Dilution:

1.0

Prep Batch: 280-270827

Lab File ID: Initial Weight/Volume: 26b040315.asc 1.09 g

Analysis Date: Prep Date:

04/03/2015 1525 04/02/2015 1430 N 4 (20/11

Final Weight/Volume:

100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8480	Ž	1.5	4.9
Antimony		1.0	7	0.37	0.59
Arsenic		5.3	_	0.65	0.99
Barium		59.8	×J	0.075	0.49
Beryllium	•	0.033	U	0.033	0.20
Boron		1.3	В	0.97	2.0
Cadmium		0.14	В	0.040	0.20
Calcium		10900	×J	13.9	49.3
Chromium		8.9	×	0.057	0.20
Cobalt		9.6	X	0.099	0.99
Copper		18.7		0.21	0.99
Iron		25800	Х	3.7	4.9
Lead		6.0		0.27	0.49
Magnesium		5960	Х	3.6	19.7
Manganese		371	X	0.099	0.99
Molybdenum		0.29	В	0.26	2.0
Nickel		12.1	X	0.12	3.9
Potassium		1510		40.4	296
Selenium		0.85	4	0.85	0.99
Silicon		418	1	5.6	9.9
Silver		0.16	U	0.16	0.20
Sodium		400		58.2	118
Vanadium		60.9		0.093	2.0
Zinc		49.7	Х	0.39	0.99

7471A Mercury (CVAA)

Analysis Method: Prep Method:

7471A 7471A Analysis Batch: Prep Batch:

280-271101 280-271051 Instrument ID: Lab File ID:

MT_033 150403aa.txt

Dilution: Analysis Date: 1.0 04/03/2015 1551

Initial Weight/Volume: Final Weight/Volume:

0.52 g 50 mL

Prep Date:

04/03/2015 1340

DryWt Corrected: Y

Result (mg/Kg)

Qualifier

MDL

RL

Analyte Mercury

0.0069

0.0069

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V504

Lab Sample ID:

280-67225-6

04/02/2015 1430

Client Matrix:

Solid

% Moisture:

4.8

Date Sampled: 03/30/2015 0927

Date Received: 04/01/2015 0940

6010B	Metals	(ICP)
~~.~~	1410 0010	,

Analysis Method:

6010B

Analysis Batch:

280-271290

Instrument ID:

MT_026

Prep Method: Dilution:

3050B 1.0

Prep Batch:

280-270827

Lab File ID:

26b040315.asc

Analysis Date:

Prep Date:

04/03/2015 1539

V 4(24/1)

Initial Weight/Volume: Final Weight/Volume: 1.24 g 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6290	Ť	1.3	4.2
Antimony		0.85	I	0.32	0.51
Arsenic		3.5		0.56	0.85
Barium	•	40.4	×J	0.064	0.42
Beryllium		0.028	υŰ	0.028	0.17
Boron		0.83	U	0.83	1.7
Cadmium		0.10	В	0.035	0.17
Calcium		9550	×Ј	11.9	42.3
Chromium		6.8	X	0.049	0.17
Cobalt		8.8	Х	0.085	0.85
Copper		16.2		0.18	0.85
Iron		24000	Х	3.2	4.2
Lead		4.3		0.23	0.42
Magnesium		5650	X	3.1	16.9
Manganese		317	Х	0.085	0.85
Molybdenum		0.22	U	0.22	1.7
Nickel		11.9	Х	0.10	3.4
Potassium		1120		34.7	254
Selenium		0.73	U_	0.73	0.85
Silicon		418	J	4.8	8.5
Silver		0.14	Ú	0.14	0.17
Sodium		258		50.0	102
Vanadium	·	55.6		0.080	1.7
Zinc		43.9	X	0.34	0.85

7471A Mercury (CVAA)

Analysis Method: Prep Method:

7471A 7471A

1.0

Analysis Batch: Prep Batch:

280-271101 280-271051 Instrument ID: Lab File ID:

MT_033 150403aa.txt

Dilution: Analysis Date:

04/03/2015 1553

Initial Weight/Volume: Final Weight/Volume:

0.60 g 50 mL

Prep Date:

04/03/2015 1340

Result (mg/Kg)

Qualifier

MDL 0.0058 RL

Analyte Mercury DryWt Corrected: Y

0.0058

Ū

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V505

Lab Sample ID:

280-67225-7

Client Matrix:

Solid

% Moisture:

7.2

Date Sampled: 03/30/2015 0858

Date Received: 04/01/2015 0940

6010B	Metals	(ICP)

Analysis Method:

6010B

Analysis Batch:

280-271290

Instrument ID: Lab File ID:

MT_026

Prep Method: Dilution:

3050B 1.0

Prep Batch:

280-270827

Initial Weight/Volume:

26b040315.asc 1.06 g

Analysis Date: Prep Date:

04/03/2015 1542 04/02/2015 1430 4/20/11

Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8360	<u>x</u>	1.6	5.1
Antimony		0.92	J	0.39	0.61
Arsenic		5.0		0.67	1.0
Barium		73.1	XT	0.077	0.51
Beryllium		0.034	U ¹	0.034	0.20
Boron		1.1	В	1.0	2.0
Cadmium		0.14	B _	0.042	0.20
Calcium		9240	XJ	14.3	50.8
Chromium		8.5	X	0.059	0.20
Cobalt		9.2	Х	0.10	1.0
Copper		20.2		0.22	1.0
Iron		24800	X	3.9	5.1
Lead		6.7		0.27	0.51
Magnesium		5570	X	3.8	20.3
Manganese	•	352	Χ	0.10	1.0
Molybdenum		0.26	U	0.26	2.0
Nickel		11.9	Х	0.12	4.1
Potassium		1190		41.7	305
Selenium		0.87	<u>u</u>	0.87	1.0
Silicon		570	J	5.8	10.2
Silver		0.16	U	0.16	0.20
Sodium		303		59.9	122
Vanadium		59.4		0.096	2.0
Zinc		47.1	X	0.40	1.0

7471A Mercury (CVAA)

Analysis Method: Prep Method:

7471A 7471A Analysis Batch: Prep Batch:

280-271101 280-271051 Instrument ID: Lab File ID:

MT_033 150403aa.txt

Dilution: Analysis Date:

1.0 04/03/2015 1555 Initial Weight/Volume: Final Weight/Volume:

0.50 g 50 mL

Prep Date:

04/03/2015 1340

DryWt Corrected: Y Analyte

Result (mg/Kg) 0.010

Qualifier

MDL 0.0071 RL

Mercury

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V506

Lab Sample ID:

280-67225-8

Client Matrix:

Solid

% Moisture:

3.9

Date Sampled: 03/30/2015 0849

Date Received: 04/01/2015 0940

6010B Metals (ICP)

Analysis Method:

6010B

Analysis Batch:

280-271290

Instrument ID:

MT_026

Prep Method: Dilution: 3050B

Prep Batch: 280-270827

27 Lab File ID:

26b040315.asc 1.08 g

Dilution: Analysis Date:

Prep Date:

1.0

04/03/2015 1544 04/02/2015 1430 r 4/20/15

Initial Weight/Volume: 1
Final Weight/Volume: 1

1.08 g 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7800	X_	1.5	4.8
Antimony		1.1	Ž	0.37	0.58
Arsenic		3.7	_	0.64	0.96
Barium		68.7	×J	0.073	0.48
Beryllium		0.032	υĪ	0.032	0.19
Boron		1.4	В	0.94	1.9
Cadmium		0.16	В	0.040	0.19
Calcium		10200	xx	13.6	48.2
Chromium		7.9	Х	0.056	0.19
Cobalt		9.3	Х	0.096	0.96
Copper		18.5		0.21	0.96
ron		25600	X	3.7	4.8
Lead		5.7		0.26	0.48
Magnesium	· .	5290	X	3.6	19.3
Manganese		371	Χ .	0.096	0.96
Molybdenum		0.25	U	0.25	1.9
Nickel		11.5	Χ	0.12	3.9
Potassium		1240		39.5	289
Selenium		0.83	<u>u</u>	0.83	0.96
Silicon		464	4	5.5	9.6
Silver		0.15	U	0.15	0.19
Sodium		387		56.9	116
Vanadium		67.0		0.091	1.9
Zinc		51.4	Х	0.38	0.96

7471A Mercury (CVAA)

Analysis Method: Prep Method:

7471A 7471A Analysis Batch: Prep Batch:

280-271101 280-271051 Instrument ID: Lab File ID: MT_033 150403aa.txt

Dilution:

1.0 04/03/2015 1558 280-27

Initial Weight/Volume: Final Weight/Volume:

0.58 g 50 mL

Analysis Date: Prep Date:

04/03/2015 1340

Analyte Mercury DryWt Corrected: Y

Result (mg/Kg)

Qualifier

MDL 0.0060 RL 0.018

0.025

17
Page 53 of 102

TestAmerica Denver

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V507

Lab Sample ID:

280-67225-9

Client Matrix:

Solid

% Moisture:

4.9

Date Sampled: 03/30/2015 0909

Date Received: 04/01/2015 0940

6010B Metals (ICP)

Analysis Method:

6010B

Analysis Batch:

280-271290

Instrument ID:

MT_026

Prep Method: Dilution:

3050B 1.0

Prep Batch:

280-270827

Lab File ID: Initial Weight/Volume:

Final Weight/Volume:

26b040315.asc 1.05 g

100 mL

Analysis Date:

04/03/2015 1547

W 4/20/00

04/02/2015 1430 Prep Date: DryWt Corrected: Y Result (mg/Kg) 7700

Analyte Qualifier MDL RL Aluminum 1.6 5.0 ×s Antimony 1.1 0.38 0.60 Arsenic 4.1 0.66 1.0 Barium 55.2 0.076 0.50 0.20 Beryllium 0.033 0.033 В 2.0 Boron 1.2 0.98 Cadmium 0.14 0.041 0.20 ×X 15000 14.1 50.1 Calcium Chromium 8.4 0.058 0.20 Х 1.0 Cobalt 9.3 0.10 0.22 1.0 Copper 18.3 5.0 24600 Х Iron 3.8 0.27 0.50 Lead 5.2 Magnesium 6550 Х 3.7 20.0 Х 0.10 1.0 Manganese 349 U 0.26 2.0 Molybdenum 0.26 Nickel Х 0.12 4.0 12.8 301 Potassium 1310 41.1 0.86 0.86 1.0 Selenium Silicon 604 5.7 10.0 0.20 Silver 0.16 0.16 Sodium 363 59.1 120 2.0 0.094 63.3 Vanadium 46.3 Х 0.40 1.0 Zinc

7471A Mercury (CVAA)

Analysis Method: Prep Method:

7471A 7471A Analysis Batch: Prep Batch:

280-271101 280-271051 Instrument ID: Lab File ID:

MT_033 150403aa.txt

Dilution: 1.0 Analysis Date: 04/03/2015 1600

Initial Weight/Volume: Final Weight/Volume:

0.58 g 50 mL

Prep Date:

04/03/2015 1340

Result (mg/Kg)

Qualifier

MDL

RL

Analyte Mercury DryWt Corrected: Y

0.0073

0.0060

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Cilent Sample ID:

J1V508

Lab Sample ID:

280-67225-10

Client Matrix:

Solid

% Moisture:

9.2

Date Sampled: 03/30/2015 0905

Date Received: 04/01/2015 0940

Analysis Method:

6010B

Analysis Batch:

280-271290

Instrument ID:

MT 026

Prep Method: Dilution:

3050B

Prep Batch:

280-270827

Lab File ID:

26b040315.asc

Analysis Date: Prep Date:

1.0

04/03/2015 1550 04/02/2015 1430 N 4/26/15

Initial Weight/Volume: 1.20 g Final Weight/Volume:

100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		9620	X_	1.4	4.6
A <i>ntimony</i>		1.0	Ť	O.35	0. 55
Arsenic		5.6		0.61	0.92
Barium		55.6	×J	0.070	0.46
Beryllium		0.10	В	0.030	0.18
Boron		1.7	В	0.90	1.8
Cadmium		0.15	В.	0.038	0.18
Calcium		16600	\mathcal{L}_{X}	12.9	45.9
Chromium		10.1	Χ	0.053	0.18
Cobalt		9.2	Χ	0.092	0.92
Copper		21.7		0.20	0.92
ron		23200	X	3.5	4.6
.ead		7.9		0.25	0.46
/lagnesium		6460	Χ	3.4	18.3
/langanese		376	Χ	0.092	0.92
Molybdenum		0.24	U	0.24	1.8
lickel		14.2	X	0.11	3.7
otassium		1400		37.6	275
Selenium		0.79	U _	0.79	0.92
Silicon		381	7	5.2	9.2
Silver		0.15	Ū	0.15	0.18
Sodium		303		54.1	110
/anadium		51.9		0.086	1.8
Zinc		47.5	Χ	0.37	0.92

7471A Mercury (CVAA)

Analysis Method: Prep Method:

7471A 7471A Analysis Batch: Prep Batch:

280-271101

Instrument ID: Lab File ID:

MT_033 150403aa.txt

Dilution: Analysis Date: 1.0

280-271051

Initial Weight/Volume: Final Weight/Volume:

0.56 g 50 mL

Prep Date:

04/03/2015 1602 04/03/2015 1340

Result (mg/Kg)

Qualifier

MDL

RL

Analyte Mercury DryWt Corrected: Y

0.013

0.0065

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V509

Lab Sample ID:

280-67225-11

Client Matrix:

Solid

% Moisture:

4.7

Date Sampled: 03/30/2015 0915

Date Received: 04/01/2015 0940

6010B	Metals	(ICP)
JU 1 V C	MIG CE 19	(ICE)

Analysis Method:

6010B 3050B Analysis Batch: Prep Batch:

280-271290 280-270827 Instrument ID: Lab File ID:

MT 026 26b040315.asc

Prep Method: Dilution: Analysis Date:

1.0

04/03/2015 1553

Prep Date:

04/02/2015 1430

ry/20/15

Initial Weight/Volume: Final Weight/Volume: 100 mL

1.12 g

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7490	X	1.5	4.7
Antimony		0.77	J	0.36	0.56
Arsenic		3.7	7	0.62	0.94
Barium		52.6	$ imes \mathcal{J}^-$	0.071	0.47
Beryllium		0.031	U	0.031	0.19
Boron		1.0	В	0.92	1.9
Cadmium		0.13	В	0.038	0.19
Calcium		9930	×J	13.2	46.8
Chromium		7.9	X	0.054	0.19
Cobalt		8.8	Х	0.094	0.94
Copper		16.9		0.20	0.94
Iron		24300	X	3.6	4.7
Lead		5.5		0.25	0.47
Magnesium		5410	X	3.5	18.7
Manganese		336	Χ	0.094	0.94
Molybdenum-		0.24	U	0.24	1.9
Nickel		12.2	X	0.12	3.7
Potassium		1180		38.4	281
Selenium		0.81	L	0.81	0.94
Silicon		556	7	5.3	9.4
Silver		0.15	U	0.15	0.19
Sodium		334		55.3	112
√anadium		60.0		0.088	1.9
Zinc		44.2	X	0.37	0.94

7471A Mercury (CVAA)

Analysis Method: Prep Method:

7471A

7471A

04/03/2015 1605

Analysis Date:

Analysis Batch: 280-271101 Prep Batch: 280-271051

Instrument ID: Lab File ID:

MT_033 150403aa.txt

Initial Weight/Volume: Final Weight/Volume:

0.52 g 50 mL

Prep Date: 04/03/2015 1340

Analyte Mercury

Dilution:

DryWt Corrected: Y

Result (mg/Kg) 0.0070

Qualifier В

MDL 0.0067

RL 0.021

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V510

Lab Sample ID:

280-67225-12

Client Matrix:

Solid

% Moisture:

6.3

Date Sampled: 03/30/2015 0922

Date Received: 04/01/2015 0940

6010B	Metals	(ICP)

Analysis Method:

6010B

Analysis Batch:

280-271290

Instrument ID:

MT_026

Prep Method: Dilution: Analysis Date: 3050B

Prep Batch:

280-270827

Lab File ID:

26b040315.asc

Prep Date:

1.0

04/03/2015 1555

04/02/2015 1430

V4/20/15

Initial Weight/Volume: Final Weight/Volume:

1.18 g 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6230	Ť	1.4	4.5
Antimony		0.85	3	0.34	0.54
Arsenic		3.4	_	0.60	0.90
Barium		45.9	$ imes \mathcal{J}$	0.069	0.45
Beryllium		0.030	U	0.030	0.18
Boron		0.97	В	0.89	1.8
Cadmium		0.11	, B	0.037	0.18
Calcium		16800	x J	12.8	45.2
Chromium		6.4	Х	0.052	0.18
Cobalt		8.2	Χ	0.090	0.90
Copper		18.4		0.20	0.90
Iron		22600	Х	3.4	4.5
Lead		4.7		0.24	0.45
Magnesium		4560	X	3.3	18.1
Manganese		293	Χ	0.090	0.90
Molybdenum		0.24	U	0.24	1.8
Nickel		9.8	Χ	0.11	3.6
Potassium		963		37.1	271
Selenium		0.78	U	0.78	0.90
Silicon		375	J	5.1	9.0
Silver		0.14	Ű	0.14	0.18
Sodium		250		53.4	109
Vanadium		55.3		0.085	1.8
Zinc		41.3	Χ	0.36	0.90

7471A Mercury (CVAA)

Analysis Method: Prep Method:

7471A 7471A 1.0

Analysis Batch: Prep Batch:

280-271101 280-271051 Instrument ID: Lab File ID:

MT_033 150403aa.txt

Dilution: Analysis Date:

04/03/2015 1612

Initial Weight/Volume: Final Weight/Volume:

0.58 g 50 mL

Prep Date:

04/03/2015 1340

Analyte DryWt Corrected: Y Mercury

Result (mg/Kg) 0.012

Qualifier

MDL 0.0061 RL 0.019

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-67225-1

SDG #: JP0934 SAF#: RC-232

Date SDG Closed: April 1, 2015
Data Deliverable: 7 Day / Summary

CLIENT ID	LABID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1V4X9	280-67225-1	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V500	280-87225-2	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V501	280-67225-3	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V502	280-67225-4	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V503	280-67225-5	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V504	280-67225-6	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V505	280-67225-7	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V506	280-67225-8	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V507	280-67225-9	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V508	280-67225-10	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V509	280-67225-11	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V510	280-67225-12	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 4/1/2015 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 2.1° C, 3.3° C and 4.1° C.

The samples presented in this report contained large rocks that were not included in the aliquots used for extraction and/or analysis.

GC SEMIVOLATILES - SW846 8082 - PCBs

The laboratory noted that a Sulfuric Acid clean-up was performed on the samples presented in this report to reduce matrix interferences.

Sample J1V506 contained a combination of Aroclor 1254 and Aroclor 1260 with insufficient separation to quantify individually. The sample has been quantified and reported as the predominant Aroclor. Due to the shared peaks of these two Aroclors, there is increased qualitative and quantitative uncertainty associated with these results.

No other anomalies were encountered.

GC SEMIVOLATILES - NWTPH-Dx - DRO

No anomalies were encountered.

HPLC - 8W846 8310 - PAHs

The RPD between the primary and confirmation columns exceeded 40% for Benzo[a]anthracene in samples J1V4X9, J1V501, J1V502 and J1V508. The lower of the two values has been reported, as matrix interference is evident on both columns. Associated results have been flagged with an "X".

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-270827 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

Low levels of Chromium are present in the method blank associated with batch 280-270827. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V4X9; therefore, control limits are not applicable.

The duplicate analysis of sample J1V4X9 exhibited RPD data outside the control limits for Barium, Boron and Mercury, and the associated sample results have been flagged "M". There is no indication that the analytical systems were operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

Washington	Closure Han	ford CH	IAIN OF CUST	ODY/	SAMPL	E ANA	LYS	S REQUES	ST .	RC-232-091	Page 1 of3
Mector STOWE, QG	经 产生的基本	Com	pany Contact	Te	lephone No.		V 5	Project Coordinator KESSNER, JH	Price C	ode	Data Turnarounk
oject Designation			an Kessner	3/	0.4008		* 155.	SAF No.		88	
100-IU-2 & 100-IU-6 Remaining Waste Sites			0-B-35:1 (shallow zone, v	rer)				RC-232		A 17	7 day
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TestAmerica Denvi her Labe Shipped To				107			T	5-88	376		T
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OSSIBLE SAMPLE HA	ZARDS/REMARKS		No. of Container(s)	100	1 2		1		4		
A			Volume	250mL	250mL	125mL	250mL				
							4375		280-67225 0	chain of Custody	Jga
pecial Handling and/or of 40	r Storage		Sample Analysis	See item (1) i Special	PC8s - 8082	TPti-Diesel Range -	PAHs - 63	10	3	100	
				Instructions		WTPH-D+					
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1/500	SOIL	03/30/19	0956	X.	×	X.	×				Market Mark
9V501	SOIL	~3(30/VS	1000	χ.	X	X	7				
1\7502	SOIL	03/30(1	5 0902	x	スポ	X	X	Sp. Sp.	7.3		
1V503	SOIL	03(30/19		×	~	X	×				
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Washington C	losure Hanfor	d CHA	IN OF CUSTO	ODYIS	AMPLE	: ANA	Pro	ect Coordinator	Price Cod	lo	Date Tur	naround
lector		Company	Contact Kessner	Teles	shone No. 4688			CESSNER, JH	- Carrier		7 4	
STOWE, QG		Sampling	Location			7.		RC-232	9.8	S	7 3	10
lect Designation 100-IU-2 & 100-IU-6 Remai	ining Waste Sites		3-35:1 (shallow zone, ve phook No.	(C	OA .	12000	Met	hod of Shipment Commercial Carri	erl feed	٤,		10.39
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TestAmerica Denvel				Cool 4C	Cool 4C	Cool 4C	Cool 4C				12.5	
			Preservation								Tel. pe	
014			Type of Container	G/P	a G	øG.	eG			- N		
			No. of Container(s)	1	4	1	1				Hart I	40.3
OSSIBLE SAMPLE HAZ	ARDS/REMARKS		Volume	250mL	250mL	125mL	250mL	7.00			1	7
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	Storage			See item (1)	700	TPH-Diesel Range -	PAHs - 8310				1:00	
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Spenium, Cinomius Spenium, Silicon J PO	SPECIAL INSTRU	4		×	X .		TPH-Distration Number 1	125mL		8.	C Cool+C		52000				
num cooped copped softwar godium	RUCTIONS -BOJOTR (Close			×	×		PA/ta-8310	250mL	1	8	684 6		B# of I	Con	SAF No. RC-23		C. 1.
Poor, Itom, Lead, III.	out Test Office									の場合			Ball of LadingJA's Ball No.	thod of Shipment Commercial Carrier	F No. RC-232	KESSNER, JH	SIS REQUEST
Mercury 7471 - (UCTIONS DIOTR (Close-on List) (Aluminum, Antimory, Arsenic, Baitum, Beryslum, Boon, Cadmium, potent (Close-on List) (Aluminum, Antimory, Arsenic, Baitum, Beryslum, Modes, Potessium, Manganaes, (Mayrodanum, Modes, Potessium)												380	Ped	88	Price Code	RC-232-091
	c Bellum, Benya Bellum, Benya							1/2						5			
	um Boron, Cadm n. Nidosi Potesai								xi.						1 dons		Page 3 013
				7				4		*		3.63 3.63 4.43					

Appendix 5

Data Validation Supporting Documentation

<u>V</u> ALIDATION LEVEL:	A	В	(c)	D	E
PROJECT: (O	U-B-35:1		DATA PACKAC	ie: JP093	14,
VALIDATOR:	ELR	LAB: TA	Ĺ	DATE:	25/15
			SDG:	170934	
		ANALYSES	PERFORMED		
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MAT					
110489	<u>111500</u>	711201 711201	211205	110503	
J1 V 504	JIUSUS	J1150C	210202	710208	
JIVSOT	210510				
		LETENESS AND o		VE	Yes No) N/
Technical verificat	tion documentation				
Comments:	tion documentation	present?	LIBRATIONS (Le	vels D and E)	Y(s No) N/
Comments: INSTRU nitial calibrations	MENT PERFORM	MANCE AND CAI	LIBRATIONS (Le	vels D and E)	Yes No N/
Comments: INSTRU nitial calibrations	MENT PERFORM performed on all in acceptable?	MANCE AND CAI	LIBRATIONS (Le	vels D and E)	Yes No N/
Comments: INSTRU nitial calibrations nitial calibrations CP interference c	MENT PERFORM performed on all in acceptable?	MANCE AND CAI	LIBRATIONS (Le	vels D and E)	Yes No N/ Yes No N/ Yes No N/ Yes No N/
Comments: INSTRU nitial calibrations CP interference c CV and CCV che	MENT PERFORM performed on all in acceptable?	MANCE AND CAI astruments?	LIBRATIONS (Le	vels D and E)	Yes No N/
Comments: INSTRU nitial calibrations nitial calibrations CP interference c CV and CCV che	MENT PERFORM performed on all in acceptable? hecks acceptable?	MANCE AND CAI astruments?	LIBRATIONS (Le	vels D and E)	Yes No N/
Comments: INSTRU Initial calibrations Initial calibrations CP interference con CV and CCV checked CV and CV checke	mentation ment perform performed on all ir acceptable? cks performed on a cks acceptable?	MANCE AND CAI astruments?	LIBRATIONS (Le	vels D and E)	Yes No N/
2. INSTRU Initial calibrations ICP interference color and CCV che ICV and CCV che ICV and CCV che ICV and CCV che ICSTRUCTOR and CCV che	mENT PERFORM performed on all in acceptable?	MANCE AND CAI astruments?	LIBRATIONS (Le	vels D and E)	Yes No N/ Yes No N/

3. BLANKS (Levels B, C, D, and E)	
ICB and CCB checks performed for all applicable analyses? (Levels D, E)	Yes No NA
ICB and CCB results acceptable? (Levels D, E)	
Laboratory blanks analyzed?	No N/A
Laboratory blank results acceptable?	Yel No N/A
Field blanks analyzed? (Levels C, D, E)	
Field blank results acceptable? (Levels C, D, E)	Yes No (N/A)
Transcription/calculation errors? (Levels D, E)	Yes No N/A
Comments: No F	<u></u>
4. ACCURACY (Levels C, D, and E)	
MS/MSD samples analyzed?	Yes No N/A
MS/MSD results acceptable?	Yes No NA
MS/MSD standards NIST traceable? (Levels D, E)	
MS/MSD standards expired? (Levels D, E)	
LCS/BSS samples analyzed?	Yes No N/A
LCS/BSS results acceptable?	
Standards traceable? (Levels D, E)	
Standards expired? (Levels D, E)	Yes No (N/A)
Transcription/calculation errors? (Levels D, E)	Yes No N/A
Performance audit sample(s) analyzed?	
Performance audit sample results acceptable?	Yes No N /A
Comments: LCS Silica (1170) - J all MS Antmy (4870) calcon (6870)	1-15-5
Ms Antmy (4870) calcon (6820)	Si (can(28 W)) a
	20-
Vio	DAT

Duplicate RPD values acceptable? Duplicate results acceptable? MS/MSD standards NIST traceable? (Levels D, E) MS/MSD standards expired? (Levels D, E) Yes No N/A Yes No N/A Field duplicate RPD values acceptable? Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) Yes NO N/A MS/MSD standards expired? (Levels D, E) Yes NO N/A
MS/MSD standards NIST traceable? (Levels D, E) Yes NO N/A MS/MSD standards expired? (Levels D, E) Yes NO N/A
\sim
Field duplicate RPD values acceptable?
Field split RPD values acceptable? Yes No WA
Transcription/calculation errors? (Levels D, E)
Comments: borrow 4225 - Jell
6. ICP QUALITY CONTROL (Levels D and E)
ICP serial dilution samples analyzed?
ICP serial dilution %D values acceptable? Yes No N/A
ICP post digestion spike required?
Standards traceable?
outline of the control of the contro
Standards expired? Yes No N/A Transcription/calculation errors? Yes No N/A
1/
Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

FURNACE AA QUALITY CONTROL (Levels D and E) Duplicate injection %RSD values acceptable? Yes No N/A Standards traceable? Yes No N/A Standards expired? Yes No N/A MSA performed as required?......Yes No N/A MSA results acceptable?......Yes No N/A Comments: 8. **HOLDING TIMES (all levels)** No N/A Samples properly preserved? Sample holding times acceptable? Yes No N/A Comments:___

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)	
Results reported for all requested analyses?	(Yes) No)
Results reported for all requested analyses? Results supported in the raw data? (Levels D, E) Samples properly prepared? (Levels D, E) Detection limits meet RDL? Transcription/calculation errors? (Levels D, E)	Yes No NA
Samples properly prepared? (Levels D, E)	Yes No N#
Detection limits meet RDL?	(.Yes) No N/A
Transcription/calculation errors? (Levels D, E)	Yes No(N/A
Comments:	

Appendix 6 Additional Documentation Requested by Client

Quality Control Results

Job Number: 280-67225-1

Sdg Number: JP0934

Method Blank - Batch: 280-270827

Client: Washington Closure Hanford

Method: 6010B Preparation: 3050B

Lab Sample ID:

MB 280-270827/1-A

Analysis Batch:

280-271290

Instrument ID:

MT_026

Client Matrix:

Solid

Prep Batch:

280-270827 N/A

mg/Kg

Lab File ID: Initial Weight/Volume: 26b040315.asc

Dilution: Analysis Date: 1.0 04/03/2015 1502 Leach Batch: Units:

Final Weight/Volume:

1.00 g 100 mL

Analysis Date: Prep Date:

Leach Date:

04/03/2015 1302

N/A

Analyte	Result	Qual	MDL	RL
Aluminum	1.6	U	1.6	5.0
Antimony	0.38	U	0.38	0.60
Arsenic	0.66	U	0.66	1.0
Barium	0.076	U	0.076	0.50
Beryllium	0.033	υ	0.033	0.20
Boron	0.98	U	0.98	2.0
Cadmium	0.041	U	0.041	0.20
Calcium	14.1	U	14.1	50.0
	0.0620	В	0.058	0.20
Chromium	0.10	Ū	0.10	1.0
Cobalt	0.22	Ü	0.22	1.0
Copper	3.8	Ū	3.8	5.0
Iron	0.27	Ü	0.27	0.50
Lead	3.7	Ü	3.7	20.0
Magnesium	0.10	Ü	0.10	1.0
Manganese	0.26	Ŭ	0.26	2.0
Molybdenum	0.12	Ü	0.12	4.0
Nickel	41.0	Ü	41.0	300
Potassium	0.86	Ü	0.86	1.0
Selenium	5.7	Ű	5.7	10.0
Silicon		Ü	0.16	0.20
Silver	0.16	U	59.0	120
Sodium	59.0		0.094	2.0
Vanadium	0.094	U	0.40	1.0
Zinc	0.40	U	0.40	1.0

Job Number: 280-67225-1

Sdg Number: JP0934

Lab Control Sample - Batch: 280-270827

Client: Washington Closure Hanford

Method: 6010B Preparation: 3050B

Lab Sample ID:

LCS 280-270827/2-A

Analysis Batch:

280-271290

Instrument ID:

MT_026

Client Matrix: Dilution:

Solid

Prep Batch:

280-270827

Lab File ID:

26b040315.asc

Analysis Date:

1.0 04/03/2015 1504

Leach Batch: Units:

N/A mg/Kg Initial Weight/Volume: Final Weight/Volume:

1.00 g 100 mL

Prep Date: Leach Date: 04/02/2015 1430

N/A

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	192.2	96	82 - 116	
Antimony	50.0	49.23	98	82 - 110	
Arsenic	100	95.49	95	85 - 110	
Barium	200	195.0	97	87 - 112	
Beryllium	5.00	4.86	97	84 - 114	
Boron	100	95.70	96	80 - 120	
Cadmium	10.0	10.76	108	87 - 110	•
Calcium	5000	4867	97	82 - 114	
Chromium	20.0	19.28	96	84 - 114	
Cobalt	50.0	48.12	96	87 - 110	
Copper	25.0	24.52	98	88 - 110	
iron	100	98.73	99	87 - 120	
Lead	50.0	49.14	98	86 - 110	
Magnesium	5000	4777	96	90 - 110	
Manganese	50.0	47.99	96	88 - 110	
Molybdenum	100	98.87	99	86 - 110	
Nickel	50.0	47.72	95	87 - 110	
Potassium	5000	4933	99	89 - 110	
Selenium	200	194.6	97	83 - 110	
Silicon	1000	111.2	11	10 - 70	
Silver	5.00	4.66	93	87 - 114	
Sodium	5000	5135	103	90 - 112	
√anadium	50.0	48.62	97	88 - 110	
Zinc	50.0	47.59	95	76 - 114	

Job Number: 280-67225-1

Sdg Number: JP0934

Matrix Spike - Batch: 280-270827

Client: Washington Closure Hanford

Method: 6010B Preparation: 3050B

Lab Sample ID:

280-67225-1

Analysis Batch:

280-271290

Instrument ID:

MT_026

Client Matrix: Dilution:

Solid

Prep Batch:

280-270827

Lab File ID:

26b040315.asc

Analysis Date:

1.0 04/03/2015 1515 Leach Batch: Units: N/A mg/Kg Initial Weight/Volume: Final Weight/Volume:

1.16 g 100 mL

Prep Date: Leach Date: 04/02/2015 1430 N/A

Analyte	Sample Res	sult/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	7630		186	9763	1147	50 - 200	4
Antimony	1.3		46.6	23.57	48	20 - 200	
Arsenic	4.5		93.2	77.76	79	76 - 111	
Barium	86.0		186	223.0	74	52 - 159	
Beryllium	0.035	υ	4.66	3.70	79	72 - 105	
Boron	2.0	В	93.2	76.20	80	80 - 120	
Cadmium	0.18	В	9.32	8.73	92	40 - 130	
Calcium	9830		4660	13010	68	43 - 165	
Chromium	8.4		18.6	24.44	86	70 - 200	
Cobalt	9.6		46.6	46.50	79	72 - 106	
Copper	19.9		23.3	37.75	77	37 - 187	
Iron	24300		93.2	25140	942	70 - 200	4
Lead	6.8		46.6	43.06	78	70 - 200	
Magnesium	4920		4660	8705	81	64 - 145	
Manganese	349		46.6	398.5	107	40 - 200	4
Molybdenum	0.37	В	93.2	77.04	82	75 - 103	
Nickel	11.9		46.6	48.13	78	61 - 126	
Potassium	1240		4660	5461	91	56 - 172	
Selenium	0.91	U	186	150.6	81	76 - 104	
Silicon	517	-	932	780.5	28	20 - 200	
Silver	0.17	U	4.66	3.53	76	75 - 141	
Sodium	299	-	4660	4681	94	78 - 111	
Vanadium	59.4		46.6	104.4	97	50 - 169	
Zinc	112		46.6	158.8	101	70 - 200	

Job Number: 280-67225-1

Sdg Number: JP0934

Duplicate - Batch: 280-270827

Client: Washington Closure Hanford

Method: 6010B Preparation: 3050B

Lab Sample ID: Client Matrix:

Solid

1.0

Analysis Date: Prep Date:

Dilution:

04/03/2015 1512 04/02/2015 1430

Leach Date:

N/A

280-67225-1

Analysis Batch: Prep Batch:

Leach Batch:

Units:

280-271290

280-270827

N/A mg/Kg Instrument ID:

Lab File ID:

MT_026 26b040315.asc

Initial Weight/Volume:

Final Weight/Volume:

1.11 g 100 mL

Analyte	Sample Resi	ult/Qual	Result	RPD	Limit	Qual
Aluminum	7630		7215	6	40	, <u>, , , , , , , , , , , , , , , , , , </u>
Antimony	1.3		1.16	10	40	
Arsenic	4.5		3.42	27	30	
Barium	86.0		56.32	42	30	M
Beryllium	0.035	U	0.032	NC	30	U
Boron	2.0	В	1.42	35	30	ВМ
Cadmium	0.18	В	0.155	16	30	В
Calcium	9830		8909	10	30	
Chromium	8.4		7.42	12	40	
Cobalt	9.6		7.91	19	30	
Copper	19.9		17.56	12	30	
Iron	24300		21760	11	40	
Lead	6.8		4.83	33	40	
Magnesium	4920		4271	14	30	
Manganese	349		304.7	13	40	
Molybdenum	0.37	В	0.25	NC	30	U
Nickel	11.9		9.89	19	30	
Potassium	1240		1139	9	40	
Selenium	0.91	U	0.84	NC	30	U
Silicon	517		561.6	8	40	
Silver	0.17	U	0.16	NC	30	U
Sodium	299	•	305.4	2	30	
Vanadium	59.4		54.89	8	30	
Zinc	112		109.9	1	40	

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Method Blank - Batch: 280-271051

Method: 7471A Preparation: 7471A

Lab Sample ID:

MB 280-271051/1-A

Analysis Batch:

280-271101

Instrument ID:

MT_033

Client Matrix:

Solid

Prep Batch:

Units:

280-271051

mg/Kg

Lab File ID:

150403aa.txt

Dilution:

1.0

Leach Batch: N/A

Initial Weight/Volume:

.6 g

Analysis Date: Prep Date:

04/03/2015 1528 04/03/2015 1340

Leach Date:

Final Weight/Volume:

50 mL

Analyte

N/A

Result

Qual

MDL

RL

Mercury

0.0055

Ū

0.0055

0.017

Lab Control Sample - Batch: 280-271051

Method: 7471A

Preparation: 7471A

Lab Sample ID: Client Matrix:

LCS 280-271051/2-A

Analysis Batch:

280-271101

Instrument ID:

MT_033

Dilution:

Solid 1.0

Prep Batch: Leach Batch: 280-271051

Lab File ID:

150403aa.txt

Analysis Date:

04/03/2015 1530

Units:

N/A mg/Kg Initial Weight/Volume:

.6 g

Prep Date:

04/03/2015 1340

Leach Date: N/A

Final Weight/Volume:

50 mL

Analyte Mercury

Spike Amount

Result 0.381 % Rec.

Limit 87 - 111 Qual

Method: 7471A

Preparation: 7471A

Lab Sample ID:

Matrix Spike - Batch: 280-271051

280-67225-1

Analysis Batch:

280-271101

Instrument ID:

Client Matrix: Dilution:

Solid

Prep Batch:

0.417

280-271051

MT_033

1.0

Leach Batch: Units:

Lab File ID:

150403aa.txt

Analysis Date:

04/03/2015 1537

04/03/2015 1340

Prep Date:

mg/Kg

Initial Weight/Volume: Final Weight/Volume:

0.56 g 50 mL

Leach Date: Analyte

N/A

Mercury 0.015

Sample Result/Qual

В

Spike Amount

0.482

Result

0.459

% Rec.

92

Limit 87 - 111 Qual

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Duplicate - Batch: 280-271051

Method: 7471A Preparation: 7471A

Lab Sample ID:

280-67225-1

04/03/2015 1340

Analysis Batch:

280-271101

Instrument ID:

MT_033

Client Matrix:

Solid

Prep Batch:

280-271051

Lab File ID:

150403aa.bd

Dilution: Analysis Date: 1.0 04/03/2015 1535

Leach Batch: Units:

N/A mg/Kg Initial Weight/Volume: Final Weight/Volume:

0.57 g 50 mL

Limit

Prep Date: Leach Date:

N/A

Analyte

Sample Result/Qual

В

Result

RPD

23

Qual

Mercury

0.015

0.0117

20 B M

Date:

27 April 2015

To:

Washington Closure Hanford Inc. (technical representative)

From:

ELR Consulting

Project:

100-IU-2 & 100-IU-6 Remaining Waste Sites - Soil Full Protocol - Waste

Subsite 100-B-35:1

Subject:

PCB - Data Package No. JP0934-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0934 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V4X9	3/30/15	Soil	С	See note 1
J1V501	3/30/15	Soil	С	See note 1
J1V502	3/30/15	Soil	С	See note 1
J1V503	3/30/15	Soil	С	See note 1
J1V504	3/30/15	Soil	С	See note 1
J1V505	3/30/15	Soil	С	See note 1
J1V506	3/30/15	Soil	С	See note 1
J1V507	3/30/15	Soil	С	See note 1
J1V508	3/30/15	Soil	С	See note 1
J1V509	3/30/15	Soil	С	See note 1
J1V510	3/30/15	Soil	С	See note 1

^{1 -} PCBs by 8082.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

Holding Times

Holding times are not applicable for PCB analysis.

Method Blank

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

Accuracy

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the

unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

Analytical Detection Levels

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

Completeness

Data Package No. JP0934 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, September 2009.

Appendix 1 Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The
 data may not be valid for some specific applications (i.e., usable for decisionmaking purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2 Summary of Data Qualification

PCB DATA QUALIFICATION SUMMARY*

SDG: JP0934	REVIEWER: ELR	Project: 100-B-35:1	PAGE_1_OF_1			
COMMENTS: No qualifiers assigned						

^{* -} The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3 Annotated Laboratory Reports

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V4X9

Lab Sample ID:

280-67225-1

Client Matrix:

Solid

% Moisture:

7.5

Date Sampled: 03/30/2015 0950

Date Received: 04/01/2015 0940

8082 Polychlorinated	Biphenvis	(PCBs) by Gas	Chromatography

Analysis Method:

8082

Analysis Batch:

280-270997

Instrument ID:

SGC_W

Prep Method: Dilution:

3550C 1.0

Prep Batch:

280-270852

Initial Weight/Volume: Final Weight/Volume: 5 mL

30.4 g

Analysis Date: Prep Date:

04/03/2015 1438 04/02/2015 1101 Injection Volume: Result Type:

1 uL PRIMARY

Acceptance Limits 59 - 130 53 - 128

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL	
Aroclor 1016		3.0	U	3.0	11	
Aroclor 1221		8.6	U	8.6	18	
Aroclor 1232		2.1	U	2.1	11	
Aroclor 1242		5.0	U	5.0	11	
Arodor 1248		5.0	U	5.0	11	
Aroclor 1254		2.8	U	2.8	11	
Arodor 1260		2.8	U	2.8	11	

Surrogate	%Rec	Qualifier
Decachlorobiphenyl	83	
Tetrachloro-m-xylene	75	

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V500

Lab Sample ID:

280-67225-2

Client Matrix:

Solid

% Moisture:

4.2

Date Sampled: 03/30/2015 0956

Date Received: 04/01/2015 0940

2022 Doluchlaringtod	Rinhanvie	(PCRe) by G	as Chromatography

Analysis Method:

8082

Analysis Batch:

280-270997

Instrument ID:

SGC_W

Prep Method:

3550C

Prep Batch:

280-270852

Initial Weight/Volume:

30.9 g

Dilution:

1.0

Final Weight/Volume:

5 mL

Analysis Date: Prep Date:

04/03/2015 1501 04/02/2015 1101 Injection Volume: Result Type:

1 uL PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.8	U	2.8	10
Arodor 1221		8.1	υ	8.1	17
Aroclor 1232		2.0	U	2.0	10
Aroclor 1242		4.7	U	4.7	10
Aroclor 1248		4.7	U	4.7	10
Aroclor 1254		2.6	U	2.6	10
Arodor 1260		2.6	U	2.6	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	84		59 - 130
Tetrachloro-m-xylene	75		53 - 128

Value

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V501

Lab Sample ID:

280-67225-3

Client Matrix:

Solid

% Moisture:

5.4

Date Sampled: 03/30/2015 1000

Date Received: 04/01/2015 0940

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography						
Analysis Method:	8082	Analysis Batch:	280-270997		Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-270852		Initial Weight/Volume:	30.7 g
Dilution:	1.0				Final Weight/Volume:	5 mL
Analysis Date:	04/03/2015 1524				Injection Volume:	1 uL
Prep Date:	04/02/2015 1101				Result Type:	PRIMARY
Analyte	DryWt Corrected: Y	Result (ug	ı/Kg)	Qualifie	r MDL	RL
Aroclor 1016		2.9	alayan ayan gara karanga kangaran da karanga kanan da karanga kanan da karanga kanan da karanga kanan da karan	U	2.9	10
Arodor 1221		8.3		U	8.3	17
Arodor 1232		2.1	*	U	2.1	10
Arodor 1242		4.8		U	4.8	10
Arodor 1248		4.8		Û	4.8	10
Aroclor 1254		2.7		U	2.7	10
Aroclor 1260		2.7		U	2.7	10
Surrogate		%Rec		Qualifie	r Accepta	nce Limits
Decachlorobipheny	1	84			59 - 130	
Tetrachloro-m-xyle	ne	72			53 - 128	

r der

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V502

Lab Sample ID:

280-67225-4

Client Matrix:

04/02/2015 1101

Solid

% Moisture:

9.8

Date Sampled: 03/30/2015 0902

Date Received: 04/01/2015 0940

8082 Polychlorinated	Biohenvis (PCBs) by Gas Ch	romatography

Analysis Method: Prep Method:

8082 3550C Analysis Batch:

280-270997

Instrument ID:

SGC_W

31.0 g

Dilution: Analysis Date:

Prep Date:

1.0 04/03/2015 1547 Prep Batch:

280-270852

Initial Weight/Volume: Final Weight/Volume:

5 mL

Injection Volume: Result Type:

1 uL PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Arodor 1016		3.0	U	3.0	11
Aroclor 1221		8.6	U	8.6	18
Aroclor 1232		2.1	U	2.1	11
Aroclor 1242		5.0	U	5.0	11
Arodor 1248		5.0	U	5.0	11
Aroclor 1254		2.8	U	2.8	11
Aroclor 1260		2.8	U	2.8	11

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	76		59 - 130
Tetrachloro-m-xylene	63		53 - 128

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V503

Lab Sample ID:

280-67225-5

Client Matrix:

Solid

% Moisture:

Result (ug/Kg)

.4.9 2.7 2.7 7.0

Date Sampled: 03/30/2015 0933

Date Received: 04/01/2015 0940

Analysis Method:

8082

Analysis Batch:

280-270997

Instrument ID:

SGC_W

Prep Method: Dilution:

3550C 1.0

Prep Batch:

280-270852

Initial Weight/Volume: Final Weight/Volume:

MDL

2.9

30.5 g 5 mL

Analysis Date: Prep Date:

04/03/2015 1656 04/02/2015 1101

Injection Volume: Result Type:

Qualifier

Ū

1 uL **PRIMARY**

RL

11

17

r tep Date	5.	UTIOLILUI		, , , , ,	
Analyte			Dr	yWt C	

Analyte	DryWt Corrected: Y
Arodor 1016	
Arodor 1221	

Arodor 1016	2.9	
Arodor 1221	8.5	
Arodor 1232	2.1	
Arodor 1242	4.9	

Aroclor 1221		
Arodor 1232		
Aroclor 1242		
Aumalou 1249		

Aroclor 1248		
Arodor 1254		
Arodor 1260		

Surrogate	%Rec
Decachlorobiphenyl	78
Tetrachloro-m-xylene	70

IJ	8.5	17	
U	2.1	11	
U	4.9	11	
U	4.9	11	
U	2.7	11	
U	2.7	11	
Qualifier	Accept	ance Limits	

59 - 130	
53 - 128	

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V504

Client: Washington Closure Hanford

Lab Sample ID:

280-67225-6

Client Matrix:

Solid

% Moisture:

66

4.8

Date Sampled: 03/30/2015 0927

Date Received: 04/01/2015 0940

8082 Polychlorinated	Biphenyls	(PCBs) by Gas	Chromatography
Analysis	Batch:	280-270997	Instrument IC

Analysis Method:

8082

D:

SGC_W

Prep Method: Dilution:

3550C 1.0

Prep Batch:

280-270852

Initial Weight/Volume: Final Weight/Volume:

30.6 g 5 mL

Analysis Date: Prep Date:

Tetrachloro-m-xylene

04/03/2015 1719 04/02/2015 1101 Injection Volume:

1 uL

Result Type:

PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL	
Arodor 1016		2.9	U	2.9	10	
Arador 1221		8.3	υ	<i>3.3</i>	17	
Arodor 1232		2.1	Ü	2.1	10	
Aroclor 1242		4.8	Ü	4.8	10	
Aroclor 1248		4.8	Ü	4.8	10	
Arodor 1254		2.7	Ū	2.7	10	
Aroclor 1260		2.7	Ü	2.7	10	
Surrogate		%Rec	Qualifier	Accepta	ance Limits	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Decachlorobiphenyl		82		59 - 130		

V-1/24/15

53 - 128

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V505

Lab Sample ID:

280-67225-7

Client Matrix:

200-0122

Solid

% Moisture:

7.2

Date Sampled: 03/30/2015 0858

Date Received: 04/01/2015 0940

Analysis Method:	8082	Analysis Batch:	280-270997	Į.	nstrument ID:	SGC_W	
Prep Method:	3550C	Prep Batch:	280-270852	1	nitial Weight/Volume:	30.3 g	
Dilution:	1.0			F	Final Weight/Volume:	5 mL	
Analysis Date:	04/03/2015 1742			I	njection Volume:	1 uL	
Prep Date:	04/02/2015 1101			F	Result Type:	PRIMARY	
Analyte	DryWt Corrected: Y	Y Result (ug/Kg)		Qualifier	MDL	RL	
Arodor 1016		3.0		Ü	3.0	11	
Arodor 1221		8.6	,	U	8.6	18	
Arodor 1232		2.1		U	2.1	11	
Aroclor 1242		5.0	1	U	5.0	11	
Aroclor 1248		5.0	1	U	5.0	11	
Aroclor 1254		2.8		U	2.8	11	
Arodor 1260		3.0		J	2.8	11	
Surrogate		%Rec		Qualifier	Acceptar	nce Limits	
Decachlorobiphenyl		81			59 - 130		
Tetrachloro-m-xyler	ne	68			53 - 128		

Vylzhlis

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V506

Lab Sample ID:

280-67225-8

Client Matrix:

Solid

% Moisture:

3.9

Date Sampled: 03/30/2015 0849

Date Received: 04/01/2015 0940

8082 Polychlorinated	Biphenyis	(PCBs) by G	as Chromatography
Analysis	Batch:	280-270997	Instrument ID

Analysis Method: Prep Method:

8082 3550C

280-270997

Instrument ID:

SGC_W 31.1 g

Dilution: 1.0

Prep Batch: 280-270852 Initial Weight/Volume: Final Weight/Volume:

5 mL

Analysis Date: Prep Date:

04/03/2015 1805 04/02/2015 1101

Injection Volume: Result Type:

1 uL PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Arodor 1016		2.8	U	2.8	10
Arodor 1221		8.1	U	8.1	17
Arodor 1232		2.0	U	2.0	10
Arodor 1242		4.7	U	4.7	10
Arodor 1248		4.7	U	4.7	10
Aroclor 1254		7.4	j	2.6	10
Arodor 1260		2.6	U	2.6	10
Surrogate		%Rec	Qualifier	Accepta	ance Limits
Decachlorobiphenyl		71		59 - 130)

Tetrachloro-m-xylene

67

53 - 128

Vy/20/15

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V507

Lab Sample ID:

280-67225-9

Client Matrix:

200-077

Solid

% Moisture:

4.9

Date Sampled: 03/30/2015 0909

Date Received: 04/01/2015 0940

	8082 Polych	lorinated Bipheny	is (PCBs) by Gas	Chromatogra	phy		
Analysis Method:	8082	Analysis Batch:	280-270997	Instrum	ent ID:	SGC_W	
Prep Method:	3550C	Prep Batch:	280-270852	Initial V	/eight/Volume:	31.4 g	
Dilution:	1.0			Final W	/eight∕Volume:	5 mL	
Analysis Date:	04/03/2015 1829			Injection	n Volume:	1 uL	
Prep Date:	04/02/2015 1101			Result	Туре:	PRIMARY	
Analyte	DryWt Corrected: Y	Result (ug/Kg)		alifier	MDL	RL	
Arodor 1016		2.8	U		2.8	10	
Aradar 1221		8.1	U		8.1	17	
Arodor 1232		2.0	U		2.0	10	
Aroclor 1242		4.7	U		4.7	10	
Aroclor 1248		4.7	υ		4.7	10	
Arodor 1254		2.6	U		2.6	10	
Aroclor 1260		2.6	Ŋ		2.6	10	
Surrogate		%Rec	Qu	alifier	Accepta	nce Limits	
Decachlorobipheny	1	75			59 - 130		
Tetrachloro-m-xylei	ne	70			53 - 128		

Vy(20/15

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V5Q8

Lab Sample ID:

280-67225-10

Client Matrix:

Solid

% Moisture:

Date Sampled: 03/30/2015 0905

Date Received: 04/01/2015 0940

	8082 Polych	ilorinated Bipheny	is (PCBs) by Ga	s Chron	natography		
Analysis Method: 8082 Prep Method: 3550C Dilution: 1.0 Analysis Date: 04/03/2015 1852 Prep Date: 04/02/2015 1101		Analysis Batch: Prep Batch:	280-270997 280-270852			SGC_W 30.6 g 5 mL 1 uL PRIMARY	
Analyte	DryWt Corrected: Y	Result (u	g/Kg)	Qualifier	MDL	RL	
Aroclor 1016		3.0	<u> </u>	U	3.0	11	
Arador 1221		8.7		u	8.7	18	
Arodor 1232		2.2		U	2.2	11	
Aroclor 1242		5.0		U	5.0	11	
Arocior 1248		5.0		U	5.0	11	
Arodor 1254		2.8		U	2.8	11	
Arodor 1260		2.8		U	2.8	11	
Surrogate		%Rec		Qualifier		nce Limits	
Decachlorobiphenyl		77			59 - 130		
Tetrachloro-m-xyler	ne	68			53 - 128	3	

M/20/15

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V509

Lab Sample ID:

280-67225-11

Client Matrix:

Solid

% Moisture:

4.7

Date Sampled: 03/30/2015 0915

Date Received: 04/01/2015 0940

	8082 Polych	hlorinated Biphenyls (PCBs) by Gas Chromatography						
Analysis Method: 8082 Prep Method: 3550C Dilution: 1.0 Analysis Date: 04/03/2015 1915 Prep Date: 04/02/2015 1101		Analysis Batch: Prep Batch:	280-270997 280-270852	Instrument ID: Initial Weight/N Final Weight/N Injection Volur Result Type:	/olume: 32.6 g /olume: 5 mL			
Analyte	DryWt Corrected: Y	Result (ug/Kg)		ilifier MDI	RL			
Arodor 1016		2.7	U	2.7	9.7			
Arodor 1221		7.7	υ	7.7	16			
Aroclor 1232		1.9	U	1.9	9.7			
Aroclor 1242		4.5	U	4.5	9.7			
Arocior 1248		4.5	Ū	4.5	9.7			
Aroclor 1254 `		2.5	U	2.5	9.7			
Arodor 1260		2.5	U	2.5	9.7			
Surrogate		%Rec	Qua	lifier	Acceptance Limits			
Decachlorobipheny		77			59 - 130			
Tetrachloro-m-xyler	ne	68			53 - 128			

V-(120/15

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V510

Lab Sample ID:

280-67225-12

Client Matrix:

Solid

% Moisture:

6.3

Date Sampled: 03/30/2015 0922

Date Received: 04/01/2015 0940

	8082 Polyci	nlorinated Bipheny	is (PCBs) by G	as Chror	natography		
Analysis Method: Prep Method:	8082 3550C	Analysis Batch: Prep Batch:	280-270997 280-270852		Instrument ID: Initial Weight/Volume:	SGC_W 31.3 g	
Dilution: Analysis Date: Prep Date:	1.0 04/03/2015 1938 04/02/2015 1101				Final Weight/Volume: Injection Volume: Result Type:	5 mL 1 uL PRIMARY	
Analyte	DryWt Corrected: Y	Result (ug/Kg)		Qualifier	MDL	RL	
Arodor 1016		2.8		U	2.8	10	
Arodor 1221		8.2		U	8.2	17	
Aroclor 1232		2.0		U	2.0	10	
Aroclor 1242		4.8		U	4.8	10	
Aroclor 1248		4.8		U	4.8	10	
Aroclor 1254		2.7		U	2.7	10	
Arodor 1260		2.7		IJ	2.7	10	
Surrogate		%Rec		Qualifier	Accepta	nce Limits	
Decachlorobipheny	1	80			59 - 130		
Tetrachloro-m-xyle	ne	72			53 - 128	1	

rulzels

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-67225-1

SDG #: JP0934 SAF#: RC-232

Date SDG Closed: April 1, 2015

Data Deliverable: 7 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1V4X9	280-67225-1	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V500	280-67225-2	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V501	280-67225-3	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V502	280-67225-4	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V503	280-67225-5	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V504	280-67225-6	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V505	280-67225-7	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310 -
J1V506	280-67225-8	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V507	280-67225-9	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V508	280-67225-10	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V509	280-67225-11	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V510	280-67225-12	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results. RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 4/1/2015 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 2.1° C, 3.3° C and 4.1° C.

The samples presented in this report contained large rocks that were not included in the aliquots used for extraction and/or analysis.

GC SEMIVOLATILES - SW846 8082 - PCBs

The laboratory noted that a Sulfuric Acid clean-up was performed on the samples presented in this report to reduce matrix interferences.

Sample J1V506 contained a combination of Aroclor 1254 and Aroclor 1260 with insufficient separation to quantify individually. The sample has been quantified and reported as the predominant Aroclor. Due to the shared peaks of these two Aroclors, there is increased qualitative and quantitative uncertainty associated with these results.

No other anomalies were encountered.

GC SEMIVOLATILES - NWTPH-Dx - DRO

No anomalies were encountered.

HPLC - SW846 8310 - PAHs

The RPD between the primary and confirmation columns exceeded 40% for Benzo[a]anthracene in samples J1V4X9, J1V501, J1V502 and J1V506. The lower of the two values has been reported, as matrix interference is evident on both columns. Associated results have been flagged with an "X".

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-270827 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

Low levels of Chromium are present in the method blank associated with batch 280-270827. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V4X9; therefore, control limits are not applicable.

The duplicate analysis of sample J1V4X9 exhibited RPD data outside the control limits for Barium, Boron and Mercury, and the associated sample results have been flagged "M". There is no indication that the analytical systems were operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

Washington Closure Hanford	Company Cont	CHAIN OF CUSTOL Company Contact Joan Kessner			DY/SAMPLE ANALYS Telephone No. 375:4688			Price Code		Data Turnaround	
TOWE, QG	Sampling Local)				RC-232 ethod of Shipment				auto
00-IU-2 & 100-IU-6 Remaining Waste Sites	Fleid Logbook No. EL-1867-03			010B3520	000		Commercial Carrier P. R.D. E. A. Bill of Leding/Air Bill No.				
RCC-08-022 ped To [estAmerica Denver	Offsite Propert	M A13	39-	}			<u> </u>	SPC	T		2
ur Labe Shipped To		reservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C				1	
my*	Тур	e of Container	G/P	∎G `	⊮ G	•G		HOUNTE			1 62 6
- COSTINADKS	No.	of Container(s)	10	1	1	1					
SSIBLE SAMPLE HAZARDS/REMARKS		Volume	250mL	250mL	125mL	250mL		280-67225 Ch	ain of Custody	MAIN BELLAND	
ecial Handling and/or Storage	8	mple Analysis	See item (1) Special Instructions	PC8s - 8082	TPH-Diesel Range - WTPH-D +	PAHs - 831	10		- 45		
S Mairix S	ample Date	Sample Time	- F								
() Sample No.	30/15	0950	X,	X		X		27	- 1 X of	N. J.	1.00
W500 SOIL 03	30/15	0956	X	×	X ·	12		1.9			
SOIL 63	(30/15	1000	X X	12	F	1×	ts raid in			ara eri galardi.	
1V502 SOIL 03	130(15_	0902	×	12	1 2	×.					id i. Ara Darib
iiV503 SOIL o	3(36)(5	ign/Print Names		leps	CIAL INSTI	RUCTIONS	ose-out-List) (Alumini	Antonomy Ar	senic Barlum, Be	aryllium, Boror	, Cadmium,
Raincephaned By Planned Toll	aceived By/Stored in	Detw/Time		0/15 550	icium, Chrom ienium, Silico	n, Silver, Sc	dium, Vanadium, Zin); Mercury - 747	ganese Molybde 1 - (CV) (Mercur)	ARTICLE PRINCES	
Padirectal and Byfreenoved From Built splanted Byfreenoved Byfree	OLO Ball C. Biroshad Received Bysisped in	Desa/Tin	5 0 3	555 6)15 100	19,30 CHAPPIS	1.39 - Jan	(RSto, 2 spired by)	0	K.V.	In man	
Relinquished By/Removed From DeterTime Relinquished By/Removed From DeterTime	Received By/Stored in	County 1 a	31/15 IApr/	5					<u> </u>	则	
FINAL SAMPLE Disposal Method	Disposed	By De	se/Time		J	P093	34				7 A

							1010	DEOLIES	T RC	232-091	Page 2 0	3
	Hanford	CHA	IN OF CUSTO	DYIS	AMPLI	EANAL	YSIS	KEWUE9	Price God		Data Turi	earound
Washington Closure	; Пантога	Company	Contact	Telep 375	BENT TO LAN.			ESSNER, JH	4			
STOWE, QG			Kessner Location	3,3				No. RC-232	88	•	٦ ٥٠	ye
	o Sites	100-E	35:1 (shallow zone, ve	r)			24-64	and of Shinment				
100-IU-2 & 100-IU-6 Remaining Wast		Field Log		ľ	0A 010B3520	000		Commercial Carr				
Cheet No. RCC-08-	220		567-03 roperty No.				BDI	of Lading/Air Bill	ь 056 <i>с</i>	*		
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			Preservation	V 1.1		10.00	4.2° 4.44	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			1	
A10			Type of Container	GIP	•G ∵	∎G.	∌G .	1.00		188		
			No. of Container(s)	1	4	100	1	1 3 1		174		1000
OSSIBLE SAMPLE HAZARDS/R	EMARKS		- 1 To 1 T		250mL	125mL	250mL					
A contract of the second			Volume	250mL	ZJUIIL.	45 34.5	- · · · · ·		500	- Per 15	1	*
						1 1 1	13.50			W. P		
special Handling and/or Storage			Sample Analysis	See item (1) i Special	PCBs - 8062	Range - WTPH-D+	PAHs - 8310					1000
cool 4C		131	341110	Instructions		Wirne	1.37					The state of the s
1			Sample Time		7		COLUMN TO A					
O Sample No.	Matrix	Sample Date	A CONTRACTOR OF THE PARTY OF TH	10.	N.E	~ ·	×				4 12/20	6.4
J1V504	SOIL O	13015	6997	12	·×	1	1.~		12 1 27	, in	2 36 3740 3 36 3	
	SOIL O	3/30/15	M858	X	×	1~	1·x			44	100	
By506	SOIL O	313011	5 0849	X	12	12.	12			100	1	
	100	3(30/1	THE STATE OF THE S	1x	1~	1	14			199		1
	SOIL	313011	5 0905		SPI	CIAL INSTI	HICTIONS			ic Rapiden Be	ry il um, Boron	Cadmkim,
CHAIN OF POSSESSI	ON A	Received By/Sto	Sign/Print Names			LOO Matela	ACTOTA (Clos	se-cut List) (Alumin Copper, Iron, Lead, Iron Vanadkim, Zi	um, Anomony, A Magnesium, Ma	genese, Molybde	num, Nickel, P	otassium,
Relicquished By/Removed DI	7-30-15		we am she	3130	S s	elenium, Silico	n, Silver, Sod	Copper, fron, Lead, lium, Vanadium, Zii	nc); Mercury - /*			
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Rolinguished By/Removed From	Date/Time	Raceled Byrs		me			ا منظم الله المالية ال 	And the second				
			isposed By D	ste/Time	Arm. A	JF	20934	↓				
FINAL SAMPLE Disposal Method									*			
DISPOSITION												

CHAIN OF P	Average No.	7	Special Handling and/or Storage	POSSIBLE SAMPLE HAZARDS/REMARKS	2	TestAmerica Denver		100-IU-2 & 100-IU-6 Remaining Waste Sites	STOWE OG	ashington C
SSESSION SOUTH TO SECURE T	SOIL		Storage	ZARDS/REMARKS			KC - 88 0 25	ming Waste Sites		Washington Closure Hanford
	catadis	Sample Date					Offette Property No	Flaid Logbook No.	60 0	OHAIN OF
3)30/3 3)30/3 3)30/3 3)30/3 3/3 3	0925	Sample Time	Sample Analysis	Volume	Type of Container	Preservation	* <i>A131</i>	O3	Joan Xessiner Location Location Location Caballow X000 V01)	OF GUSTO
250 250 250 250 250 250 250 250 250 250	××		ham (1) in Special Partners	260mL 250mL	- 8	Cool 4C	397	010E352000		CUSTODY/SAMPLE ANAL
SPECIAL INSTRUCTIONS (1) ICP Media - conjunt (Co) (2) ICP Media - conjunt (Co) (2) ICP Media - conjunt (Co) (3) ICP Media - conjunt (Co) (4) ICP Media - conjunt (Co) (5) ICP Media - conjunt (Co) (6) ICP Media - conjunt (Co) (6) ICP Media - conjunt (Co) (7) ICP Media - conjunt			TPHOMAN Range - WITHHO+	2	. 8	Cool-4C		8		ANAL
HEAVE INSTRUCTIONS (i) CP Melais - Sotoria (Coose-con Lid) (Attractum, Androom) (ii) CP Melais - Sotoria (Coose-con Lid) (Attractum, Androom) (iii) CP Melais - Sotoria (Cooper, Iron, Lead, Megnalaim) (iii) Cooper, Iron, Lead, Megnalaim, Androom) (iii) Cooper, Iron, Lead, Megnalaim, Androom, An	××	×	PANE - 800	25001	- 8	Cool+c	\$	Z 3	RC-232	YSIS REQUEST
um, Anteriory)							OSAC	Ped CX		RC-232-091 Price Code
Beyyeur, Boonco						100	e la constant		1 don	Page 3 013

Appendix 5

Data Validation Supporting Documentation

HNF-20433 REV 0

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	В	$\binom{c}{}$	D	E		
PROJECT: /(10-13-35:	(DATA PACKAG	E: JPO93	4		
VALIDATOR:	ELR	LAB: TA	-	DATE: \mathcal{L}	25/15		
			SDG: JA	00934			
ANALYSES PERFORMED							
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)				
SAMPLES/MAT	RJX						
2114	e llus	so Jius	ol dius	2 11US	03		
Jivsoy	Jluso	is Jiuso	ac divs	67 Ulus	096		
110509							
					50(
	tion documentation		CASE NARRATIV		Yes No N/A		
Initial calibrations Continuing calibra Standards traceab Standards expired Calculation check DDT and endrin b	acceptable?	ble?			Yes No N/AYes No N/AYes No N/A		
Comments:							

HNF-20433 REV 0

PCB DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)	
Calibration blanks analyzed? (Levels D, E)	Yes No
Calibration blank results acceptable? (Levels D, E)	Yes No N/A
Laboratory blanks analyzed?	
Laboratory blank results acceptable?	Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E)	
Field/trip blank results acceptable? (Levels C, D, E)	Yes Nd N/
Transcription/calculation errors? (Levels D, E)	Yes No (N/)
Comments:	no FB
4. ACCURACY (Levels C, D, and E) Surrogates analyzed?	
Surrogate recoveries acceptable?	(Yes) No N/A
Surrogates traceable? (Levels D, E)	Yes No N/A
Surrogates expired? (Levels D, E)	Yes No (N/A)
MS/MSD samples analyzed?	Ves No N/A
MS/MSD results acceptable?	Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes No N/A
MS/MSD standards expired? (Levels D, E)	Yes No N/A
LCS/BSS samples analyzed?	Yes No N/A
LCS/BSS results acceptable?	Ye No N/A
Standards traceable? (Levels D, E)	Yes No (N/A)
Standards expired? (Levels D, E)	Yes N N/
Transcription/calculation errors? (Levels D, E)	
Performance audit sample(s) analyzed?	
Performance audit sample results acceptable?	
Comments:	
	no PAT

HNF-20433 REV 0

PCB DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)	
Duplicate RPD values acceptable?	
Duplicate results acceptable?	(Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes No (N/A)
MS/MSD standards expired? (Levels D, E)	Yes No (N/A)
Field duplicate RPD values acceptable?	No (MA)
Field split RPD values acceptable?	
Transcription/calculation errors? (Levels D, E)	Yes No N/A
Comments:	
6. SYSTEM PERFORMANCE (Levels D and E)	
Chromatographic performance acceptable?	Yes No N/A
Positive results resolved acceptably?	Yes No N/A
Comments:	
7. HOLDING TIMES (all levels)	CV N/A
Samples properly preserved?	
Sample holding times acceptable?	Yes No N/A
Comments:	

PCB DATA VALIDATION CHECKLIST

	TON LIMITS (all
levels)	\mathcal{C}
Compound identification acceptable? (Levels D, E)	Yes No (N/A)
Compound quantitation acceptable? (Levels D, E)	Yes No (N/A)
Results reported for all requested analyses?	Yes No NA
Results supported in the raw data? (Levels D, E)	Yes No (N/A)
Samples properly prepared? (Levels D, E)	Yes No N/A
Detection limits meet RDL?	Yes) No N/A
Transcription/calculation errors? (Levels D, E)	Yes No N/A
Comments:	
9. SAMPLE CLEANUP (Levels D and E)	
Fluoricil ® (or other absorbent) cleanup performed?	Yes No N/A
Lot check performed?	\ 1
Check recoveries acceptable?	Į.
GPC cleanup performed?	Yes No N/A
GPC check performed?	Yes No N/A
GPC check recoveries acceptable?	Yes No N/A
GPC calibration performed?	Yes No N/A
GPC calibration check performed?	Yes No N/A
GPC calibration check retention times acceptable?	Yes No N/A
Check/calibration materials traceable?	Yes No N/A
Check/calibration materials Expired?	Yes N/A
Analytical batch QC given similar cleanup?	Yes No N/A
	V N- N/A
Transcription/Calculation Errors?	Yes No N/A

Appendix 6 Additional Documentation Requested by Client

Job Number: 280-67225-1

Sdg Number: JP0934

Method Blank - Batch: 280-270852

Client: Washington Closure Hanford

Method: 8082 Preparation: 3550C

Lab Sample ID:		
Client Matrix:		
Dilution:		
Analysis Date:		

Prep Date:

Leach Date:

MB 280-270852/1-A Solid 1.0

N/A

04/03/2015 1351

04/02/2015 1101

Analysis Batch: Prep Batch: Leach Batch: Units:

280-270997 280-270852 N/A ug/Kg

Instrument ID: Lab File ID: Initial Weight/Volume: Final Weight/Volume:

Column ID:

SGC_W 04031518.D 32.5 g 5 mL 1 uL

Injection Volume: PRIMARY

Analyte	Result	Qual	MDL	RL	
Aroclor 1016	2.6	U	2.6	9.2	
Arodor 1221	7.4	Ü	7.4	15	
Arodor 1232	1.8	Ù	1.8	9.2	
Arodor 1242	4.3	U	4.3	9.2	
Aroclor 1248	4.3	U	4.3	9.2	
Arodor 1254	2.4	U	2.4	9.2	
Aroclor 1260	2.4	U	2.4	9.2	

Surrogate	% Rec	Acceptance Limits
Decachlorobiphenyl	92	59 - 130
Tetrachloro-m-xylene	77	53 - 128

Lab Control Sample - Batch: 280-270852

Method: 8082 Preparation: 3550C

Lab Sample ID: Client Matrix: Dilution:

Analysis Date:

Prep Date:

Leach Date:

Solid 1.0

N/A

04/03/2015 1414 04/02/2015 1101

LCS 280-270852/2-A

Analysis Batch: Prep Batch:

Units:

280-270997 280-270852 N/A Leach Batch:

ug/Kg

Instrument ID: Lab File ID: Initial Weight/Volume: SGC_W 04031519.D 30.6 g 5 mL

Final Weight/Volume: Injection Volume: Column ID:

1 uL PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aroclor 1016	32.7	26.9	82	54 - 132	
Arodor 1260	32.7	28.9	88	62 - 129	
Surrogate	%	Rec	A	cceptance Limits	
Decachlorobiphenyl		92		59 - 130	
Tetrachloro-m-xylene	;	82		53 - 128	

Job Number: 280-67225-1

Sdg Number: JP0934

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 280-270852

Method: 8082 Preparation: 3550C

MS Lab Sample ID:

280-67225-4 Solid

Analysis Batch:

280-270997 280-270852 Instrument ID:

SGC_W

Client Matrix: Dilution:

1.0

Client: Washington Closure Hanford

Prep Batch: Leach Batch: N/A Lab File ID: Initial Weight/Volume: 04031524.D 31.3 g

Analysis Date: Prep Date:

04/03/2015 1610 04/02/2015 1101 Final Weight/Volume: Injection Volume:

5 mL 1 uL

Leach Date:

N/A

Column ID:

PRIMARY

MSD Lab Sample ID:

280-67225-4 Solid

Analysis Batch: Prep Batch:

280-270997 280-270852

67

Instrument ID: Lab File ID:

SGC_W 04031525.D

Client Matrix: Dilution:

Leach Batch:

N/A

Initial Weight/Volume: Final Weight/Volume:

32.2 g 5 mL

Analysis Date: Prep Date:

Analyte

04/03/2015 1633 04/02/2015 1101

Injection Volume: Column ID:

1 uL **PRIMARY**

Leach Date:

Aroclor 1016 Aroclor 1260 Surrogate

N/A

2	6 Rec.					
MS	MSĎ	Limit	RPD	RPD Limit	MS Qual	MSD Qual
71	73 ⁵ ₇	54 - 132	0	26	***************************************	
70	72	62 - 129	0	26		
	MS % Rec	MSD 9	% Rec	Acc	eptance Limit	S
	76	80			9 - 130	

Decachlorobiphenyl Tetrachloro-m-xylene

64

Units: ug/Kg

Method: 8082 Preparation: 3550C

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 280-270852

280-67225-4

MS Lab Sample ID:

Client Matrix: Dilution:

Solid 1.0

Analysis Date:

04/03/2015 1610

Prep Date:

04/02/2015 1101

Leach Date:

N/A

MSD Lab Sample ID:

280-67225-4

53 - 128

Client Matrix:

Solid 1.0

Dilution: Analysis Date:

04/03/2015 1633

Prep Date: Leach Date: 04/02/2015 1101 N/A

MSD Spike MS MSD MS Spike Sample Result/Qual Result/Qual Result/Qual Amount Amount Analyte 25.2 25.1 U 35.4 34.4 Aroclor 1016 3.0 24.8 24.8 34.4 U 35.4 Arodor 1260 2.8

Date:

27 April 2015

To:

Washington Closure Hanford Inc. (technical representative)

From:

ELR Consulting

Project:

100-IU-2 & 100-IU-6 Remaining Waste Sites - Soil Full Protocol - Waste

Subsite 100-B-35:1

Subject:

Polyaromatic Hydrocarbon - Data Package No. JP0934-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0934 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J1V4X9	3/30/15	Soil	С	See note 1
J1V501	3/30/15	Soil	С	See note 1
J1V502	3/30/15	Soil	C	See note 1
J1V503	3/30/15	Soil	С	See note 1
J1V504	3/30/15	Soil	C	See note 1
J1V505	3/30/15	Soil	С	See note 1
J1V506	3/30/15	Soil	С	See note 1
J1V507	3/30/15	Soil	C	See note 1
J1V508	3/30/15	Soil	С	See note 1
J1V509	3/30/15	Soil	С	See note 1
J1V510	3/30/15	Soil	С	See note 1

^{1 -} Polyaromatic hydrocarbons by 8310.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Data Requested by Client

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

Method Blanks

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

Field Blanks

No field blank was submitted for analysis.

Accuracy

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in

duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

Completeness

Data package No. JP0934 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, September 2009.

Appendix 1 Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

POLYAROMATIC HYDROCARBON DATA QUALIFICATION SUMMARY*

SDG: JP0934	REVIEWER: ELR	Project: 100-B-35:1	PAGE_1_OF_1		
COMMENTS: No qualifiers assigned					

^{* -} The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3 Annotated Laboratory Reports

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V4X9

Lab Sample ID:

280-67225-1

Client Matrix:

Solid

% Moisture:

7.5

Date Sampled: 03/30/2015 0950

Date Received: 04/01/2015 0940

8310 PAHs (HPLC)

Analysis Method:

8310

Analysis Batch:

280-271012

Instrument ID:

CHHPLC_G

Prep Method: Dilution:

3550C 1.0

Client: Washington Closure Hanford

Prep Batch:

280-270855

Initial Weight/Volume: Final Weight/Volume:

30.3 g 4 mL

Analysis Date:

Injection Volume:

20 uL

Prep Date:

04/03/2015 1208 04/02/2015 1623

Result Type:

PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		11	U	11	110
Acenaphthylene		9.6	υ	9. 6	110
Anthracene		3.3	U	3.3	21
Benzo[a]anthracene		9.1	JX	3.4	16
Benzo[a]pyrene		17		6.9	16
Benzo[b]fluoranthene		65		4.5	16
Benzo[g,h,i]perylene		55		7.7	32
Benzo[k]fluoranthene		10	J	4.2	16
Chrysene		14	J	5.2	43
Dibenzo(a,h)anthracene		12	U .	12	32
luoranthene		17	J	14	43
Fluorene		5.6	U	5.6	32
ndeno[1,2,3-cd]pyrene		51		13	32
Naphthalene		13	U	13	110
Phenanthrene		13	U	13	43
Pyrene		23	J	13	43
Surrogate		%Rec	Qualifier	Accepta	nce Limits
Terphenyl-d14 (SUR)		94		72 - 115	

My/26/11

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V500

Lab Sample ID:

280-67225-2

Client Matrix:

Solid

% Moisture:

4.2

Date Sampled: 03/30/2015 0956

Date Received: 04/01/2015 0940

8310 PAHs (HPLC)

Analysis Method:

8310 3550C Analysis Batch:

280-271012

Instrument ID:

CHHPLC_G

Prep Method:

Prep Batch:

280-270855

Initial Weight/Volume:

31.1 g

Dilution:

1.0

Final Weight/Volume:

4 mL 20 uL

Analysis Date: Prep Date:

04/03/2015 1238 04/02/2015 1623 Injection Volume: Result Type:

PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		10	U	10	100
Acenaphthylene		9.1	IJ	9.1	100
Anthracene		3.1	U	3.1	20
Benzo[a]anthracene		3.2	U	3.2	15
Benzo[a]pyrene		6.5	U	6.5	15
Benzo[b]fluoranthene		4.2	Ü	4.2	15
Benzo[g,h,i]perylene		7.2	Ū	7.2	30
		4.0	U	4.0	15
Benzo[k]fluoranthene		4.9	Ü	4.9	40
Chrysene		11	Ū	11	30
Dibenzo(a,h)anthracene		13	Ü	13	40
Fluoranthene		5.3	ŭ	5.3	30
Fluorene		12	Ū	12	30
Indeno[1,2,3-cd]pyrene		12	ŭ	12	100
Naphthalene		12	. บั	12	40
Phenanthrene Pyrene		12	Ü	12	40
r yiciio		.=			
Surrogate		%Rec	Qualifier	Accepta	nce Limits
Terphenyl-d14 (SUR)		92		72 - 115	5

Job Number: 280-67225-1 Client: Washington Closure Hanford

Sdg Number: JP0934

Client Sample ID:

J1V501

Lab Sample ID:

280-67225-3

Client Matrix:

Prep Date:

Solid

% Moisture:

5.4

Date Sampled: 03/30/2015 1000

Date Received: 04/01/2015 0940

0040	PAHs	/LIDE	~
8.510	PARE	COP1.	

Analysis Method:

8310 3550C Analysis Batch: Prep Batch:

280-271012 280-270855 Instrument ID: Initial Weight/Volume: CHHPLC_G

Prep Method: Dilution: 1.0

Analysis Date:

04/03/2015 1410 04/02/2015 1623 Final Weight/Volume: Injection Volume:

32.0 g 4 mL

20 uL

Result	Type:

PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.9	U	9.9	99
Acenaphthylene		8.9	Ŋ	8.9	99
Anthracene		3.0	U	3.0	20
Benzo[a]anthracene		3.4	JX	3.2	15
Benzo[a]pyrene		6.4	U	6.4	15
Benzo[b]fluoranthene		4.2	U	4.2	15
Benzo[g,h,i]perylene		7.1	U	7.1	30
Benzo[k]fluoranthene		3.9	U	3.9	15
Chrysene		4.8	U	4.8	40
Dibenzo(a,h)anthracene		11	U	11	30
Fluoranthene		13	U	13	40
Fluorene		5.2	U	5.2	30
Indeno[1,2,3-cd]pyrene		12	U	12	30
Naphthalene		12	U	12	99
Phenanthrene		12	U	12	40
Pyrene		12	U	12	40
Surrogate		%Rec	Qualifier	Accepta	ance Limits
Terphenyl-d14 (SUR)		88		72 - 115	5

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V502

Client: Washington Closure Hanford

Lab Sample ID:

280-67225-4

Client Matrix:

Solid

% Moisture:

9.8

Date Sampled: 03/30/2015 0902

Date Received: 04/01/2015 0940

8310 PAHs (HPLC)

Analysis Method:

8310

Analysis Batch:

280-271012

Instrument ID:

CHHPLC_G

Prep Method: Dilution:

3550C

Prep Batch:

Initial Weight/Volume: Final Weight/Volume:

31.5 g

Analysis Date:

1.0

280-270855

Injection Volume:

4 mL 20 uL

Prep Date:

04/03/2015 1440 04/02/2015 1623

Result Type:

PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		11	U	11	110
Acenaphthylene		9.5	n	9.5	110
Anthracene	•	3.2	U	3.2	21
Benzo(a)anthracene		15	JΧ	3.4	16
Benzo[a]pyrene		6.8	U	6.8	16
Benzo[b]fluoranthene		9.2	J	4.4	16
Benzo[g,h,i]perylene		7.6	ū	7.6	32
Benzo[k]fluoranthene		4.2	Ū	4.2	16
		10	J	5.1	42
Chrysene Dibenzo(a,h)anthracene		12	Ü	12	32
Fluoranthene		17	.1	14	42
		5.6	Ü	5.6	32
Fluorene		13	Ŭ	13	32
Indeno[1,2,3-cd]pyrene		13	Ŭ	13	110
Naphthalene		13	Ŭ	13	42
Phenanthrene			J	13	42
Pyrene		14	J	10	· -
Surrogate		%Rec	Qualifier	Accepta	nce Limits
Terphenyl-d14 (SUR)		87		72 - 115	

ry/24/15

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V503

Client: Washington Closure Hanford

Lab Sample ID:

280-67225-5

Client Matrix:

Solid

% Moisture:

7.0

Date Sampled: 03/30/2015 0933

Date Received: 04/01/2015 0940

8310 PAHs (HPLC)

Analysis Method:

8310

Analysis Batch:

280-271012

Instrument ID:

CHHPLC_G

Prep Method: Dilution:

3550C 1.0

Prep Batch:

Initial Weight/Volume: Final Weight/Volume: 31.8 g 4 mL

Analysis Date:

280-270855

Injection Volume:

20 uL

Prep Date:

04/03/2015 1511 04/02/2015 1623

Result Type:

PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		10	U	10	100
Acenaphthylene		9.1	υ	9.1	100
Anthracene		3.1	U	3.1	20
Benzo[a]anthracene		3.2	U	3.2	15
Benzo[a]pyrene		6.5	U	6.5	15
Benzo[b]fluoranthene		4.3	υ	4.3	15
Benzo[g,h,i]perylene		7.3	U	7.3	30
Benzo[k]fluoranthene		4.0	U	4.0	15
Chrysene		4.9	U	4.9	41
Dibenzo(a,h)anthracene		11	U	11	30
Fluoranthene	•	13	U	13	41
Fluorene		5.4	U	5.4	30
Indeno[1,2,3-cd]pyrene		12	U	12	30
Naphthalene		12	U	12	100
Phenanthrene		12	U	12	41
Pyrene		12	U	12	41
Surrogate		%Rec	Qualifier	Accepta	nce Limits
Terphenyl-d14 (SUR)		89		72 - 115	

M/20/15

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V504

Lab Sample ID:

280-67225-6

Client Matrix:

Solid

% Moisture:

4.8

Date Sampled: 03/30/2015 0927

Date Received: 04/01/2015 0940

8310	PAHS	(HPLC)	i

Analysis Method:

8310

Analysis Batch:

280-271012

Instrument ID:

CHHPLC_G

Prep Method:

3550C

Initial Weight/Volume:

Dilution:

Prep Batch:

280-270855

Final Weight/Volume:

32.3 g

1.0

Injection Volume:

4 mL 20 uL

Analysis Date: Prep Date:

Terphenyl-d14 (SUR)

04/03/2015 1541 04/02/2015 1623

Result Type:

PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.8	U	9.8	98
Acenaphthylene		8.8	U	8.8	98
Anthracene		3.0	U	3.0	20
Benzo[a]anthracene		3.1	U	3.1	15
Benzo[a]pyrene		6.3	U	6.3	15
Benzo[b]fluoranthene		4.1	U	4.1	15
Benzo[g,h,i]perylene		7.0	U	7.0	29
Benzo[k]fluoranthene		3.8	U	3.8	15
Chrysene		4.7	U	4.7	39
Dibenzo(a,h)anthracene		11	U	11	29
Fluoranthene		13	U	13	39
Fluorene		5.1	U	5.1	29
indeno[1,2,3-cd]pyrene		12	U	12	29
Naphthalene		12	U	12	98
Phenanthrene		12	U	12	39
Pyrene		12	U	12	39
Surrogate		%Rec	Qualifier	Acceptance Limits	

V (2000

72 - 115

Client: Washington Closure Hanford

Job Number: 280-67225-1

, Sdg Number: JP0934

Client Sample ID:

J1V505

Lab Sample ID:

280-67225-7

Client Matrix:

Solid

% Moisture:

Date Sampled: 03/30/2015 0858

Date Received: 04/01/2015 0940

8310 PAHs (HPLC)

Analysis Method:

8310

Analysis Batch:

280-271012

7.2

Instrument ID:

CHHPLC_G

Prep Method:

3550C

Initial Weight/Volume:

32.1 g

Dilution:

1.0

Prep Batch:

280-270855

Final Weight/Volume: Injection Volume:

4 mL

Analysis Date: Prep Date:

04/03/2015 1642 04/02/2015 1623

Result Type:

20 uL **PRIMARY**

Anaiyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		10	U	10	100
Acenaphthylene		9.1	IJ	9.1	100
Anthracene		3.1	U	3.1	20
Benzo[a]anthracene		3.2	U	3.2	15
Benzo[a]pyrene		6.5	U	6.5	15
Benzo[b]fluoranthene		4.2	U	4.2	15
Benzo[g,h,i]perylene		7.2	U	7.2	30
Benzo[k]fluoranthene		4.0	U	4.0	15
Chrysene		4.9	U	4.9	40
Dibenzo(a,h)anthracene		11	U	11	30
Fluoranthene		13	U	13	40
-luorene		5.3	U	5.3	30
ndeno[1,2,3-cd]pyrene		12	U	12	30
Naphthalene		12	U	12	100
Phenanthrene		12	U	12	40
Pyrene		12	U	12	40
Surrogate		%Rec	Qualifier	Accepta	nce Limits
Terphenyl-d14 (SUR)		89		72 - 115	

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V506

Client: Washington Closure Hanford

Lab Sample ID:

280-67225-8

Client Matrix:

Solid

% Moisture:

3.9

Date Sampled: 03/30/2015 0849

Date Received: 04/01/2015 0940

8310 PAHs (HPLC)

Analysis Method:

8310

Analysis Batch:

280-271012

Instrument ID:

CHHPLC_G

Prep Method:

3550C

Prep Batch:

280-270855

Initial Weight/Volume: Final Weight/Volume:

30.5 g

Dilution:

1.0

Injection Volume:

4 mL 20 uL

Analysis Date: Prep Date:

04/03/2015 1713 04/02/2015 1623

Result Type:

PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL.	RL
Acenaphthene		10	U	10	100
Acenaphthylene		9.2	U	9.2	100
Anthracene		3.1	U	3.1	20
Benzo[a]anthracene		17	X	3.3	15
Benzo[a]pyrene		13	J	6.6	15
		18		4.3	15
Benzo[b]fluoranthene		7.4	U	7.4	31
Benzo[g,h,i]perylene		6.2	J	4.0	15
Benzo[k]fluoranthene		19	Ĵ	5.0	41
Chrysene		11	Ü	11	31
Dibenzo(a,h)anthracene		13	Ü	13	41
Fluoranthene		5.4	Ü	5.4	31
Fluorene		16	ī	12	31
Indeno[1,2,3-cd]pyrene		12	U	12	100
Naphthalene		12	Ü	12	41
Phenanthrene			j	12	41
Pyrene		12	J	12.	71
Surrogate		%Rec	Qualifier	Accepta	ince Limits
Terphenyl-d14 (SUR)		91		72 - 115	

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V507

Client: Washington Closure Hanford

Lab Sample ID:

280-67225-9

Client Matrix:

Solid

% Moisture:

4.9

Date Sampled: 03/30/2015 0909

Date Received: 04/01/2015 0940

8310 PAHs (HPLC)

Analysis Method:

8310

Analysis Batch:

280-271012

Instrument ID:

CHHPLC_G

Prep Method:

3550C

Prep Batch:

280-270855

Initial Weight/Volume: Final Weight/Volume:

31.4 g

Dilution:

1.0

4 mL

Analysis Date: Prep Date:

04/03/2015 1743 04/02/2015 1623 Injection Volume: Result Type:

20 uL **PRIMARY**

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		10	U	10	100
Acenaphthylene		9.0	U	9.0	100
Anthracene		3.1	U	3.1	20
Benzo[a]anthracene		3.2	U	3.2	15
Benzo[a]pyrene		6.4	U	6.4	15
Benzo[b]fluoranthene		4.2	U	4.2	15
Benzo[g,h,i]perylene		7.2	υ	7.2	30
Benzo[k]fluoranthene		4.0	U	4.0	15
Chrysene		4.9	U	4.9	40
Dibenzo(a,h)anthracene		11	U	11	30
Fluoranthene		13	U	13	40
Fluorene		5.3	U	5.3	. 30
Indeno[1,2,3-cd]pyrene		12	U	12	30
Naphthalene		12	U	12	100
Phenanthrene		12	U	12	40
Pyrene		12	U	12	40
Surrogate		%Rec	Qualifier	Accepta	nce Limits
Terphenyl-d14 (SUR)		88		72 - 115	

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V508

Client: Washington Closure Hanford

Lab Sample ID:

280-67225-10

04/02/2015 1623

Client Matrix:

Solid

% Moisture:

9.2

Date Sampled: 03/30/2015 0905

Date Received: 04/01/2015 0940

8310	PAHs	(HPI	C١
0314		11 11 C	~;

Analysis Method:

8310

Analysis Batch:

280-271012

Instrument ID:

CHHPLC_G

Prep Method:

3550C

Prep Batch:

280-270855

Initial Weight/Volume: Final Weight/Volume:

30.1 g

Dilution: Analysis Date:

Prep Date:

1.0 04/03/2015 1814

Final Weight Volume:

4 mL 20 uL

Result Type:

PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		11	U	11	110
•		9.9	U	9.9	110
Acenaphthylene		3.3	Ü	3.3	22
Anthracene		3.5	Ü	3.5	16
Benzo[a]anthracene		7.0	Ü	7.0	16
Benzo[a]pyrene		4.6	. U	4.6	16
Benzo[b]fluoranthene			Ü	7.9	33
Benzo(g,h,i)perylene		7.9	Ŭ	4.3	16
Benzo[k]fluoranthene		4.3	U	5.3	44
Chrysen e		5.3		12	33
Dibenzo(a,h)anthracene		12	U		44
Fluoranthene		14	U	14	33
Fluorene		5.8	U.	5.8	= "
ndeno[1,2,3-cd]pyrene		13	U	13	33
Naphthalene		13	U	13	110
Phenanthrene		13	U	13	44
Pyrene		13	U	13	44
_		%Rec	Qualifier	Accepta	ance Limits
Surrogate			~~~~	72 - 11	
Terphenyl-d14 (SUR)		88			-

rul zula

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V509

Client: Washington Closure Hanford

Lab Sample ID:

280-67225-11

Client Matrix:

Solid

% Moisture:

4.7

Date Sampled: 03/30/2015 0915

Date Received: 04/01/2015 0940

8310	PAHS	(HPLC)

Analysis Method:

8310

Analysis Batch:

280-271012

Instrument ID:

CHHPLC_G

Prep Method:

3550C 1.0

Prep Batch:

280-270855

Initial Weight/Volume:

30.8 g

Dilution:

Final Weight/Volume: Injection Volume:

4 mL

Analysis Date: Prep Date:

04/03/2015 1845 04/02/2015 1623

Result Type:

20 uL PRIMARY

Analyte Dry	Wt Corrected: Y	Result (ug/Kg)	Qualifier	MDL.	RL
Acenaphthene		10	U	10	100
Acenaphthylene		9.2	U	9.2	100
Anthracene		3.1	U	3.1	20
Benzo[a]anthracene		3.3	U	3.3	15
Benzo[a]pyrene		6.6	U	6.6	15
Benzo[b]fluoranthene		4.3	U	4.3	15
Benzo[g,h,i]perylene		7.4	U	7.4	31
Benzo[k]fluoranthene		4.0	U	4.0	15
Chrysene		4.9	U	4.9	41
Dibenzo(a,h)anthracene		11	U	11	31
Fluoranthene		13	U	13	41
Fluorene		5.4	υ	5.4	31
Indeno[1,2,3-cd]pyrene		12	U	12	31
Naphthalene		12	U	12	100
Phenanthrene		12	U	12	41
Pyrene		12	U	12	41
Surrogate		%Rec	Qualifier	Accepta	nce Limits
Terphenyl-d14 (SUR)		89		72 - 115	

My /26/15

Job Number: 280-67225-1

Sdg Number: JP0934

Client Sample ID:

J1V510

Client: Washington Closure Hanford

Lab Sample ID:

280-67225-12

Client Matrix:

Solid

% Moisture:

6.3

Date Sampled: 03/30/2015 0922

Date Received: 04/01/2015 0940

8310 PAHs (HPLC)

Analysis Method:

8310 3550C Analysis Batch:

280-271012

Instrument ID:

CHHPLC_G

Prep Method: Dilution:

1.0

Prep Batch: 280-270855 Initial Weight/Volume:

30.6 g

Analysis Date:

Final Weight/Volume:

4 mL 20 uL

Prep Date:

04/03/2015 1915 04/02/2015 1623

Injection Volume: Result Type:

PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		10	U	10	100
Acenaphthylene		9.4	U	9.4	100
Anthracene		3.2	U	3.2	21
Benzo[a]anthracene		3.3	U	3.3	16
Benzo(a)pyrene		6.7	U	6.7	16
Benzo[b]fluoranthene		4.4	U	4.4	16
Benzo(g,h,i]perylene		7.5	υ	7.5	31
Benzo[k]fluoranthene		4.1	U	4.1	16
Chrysene		5.1	Ü	5.1	42
Dibenzo(a,h)anthracene	•	12	Ū	12	31
Fluoranthene		14	U	14	42
Fluorene		5.5	U	5.5	31
indeno[1,2,3-cd]pyrene		13	Ū	13	31
Naphthalene		13	Ü	13	100
Phenanthrene		13	Ü	13	42
Pyrene		13	U	13	42
Surrogate		%Rec	Qualifier	Accepta	nce Limits
Terphenyl-d14 (SUR)		91		72 - 115	

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-67225-1

SDG #: JP0934 SAF#: RC-232

Date SDG Closed: April 1, 2015 Data Deliverable: 7 Day / Summary

CLIENT ID	LABID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1V4X9	280-67225-1	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V500	280-67225-2	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V501	280-67225-3	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V502	280-67225-4	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V503	280-67225-5	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V504	280-67225-6	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V505	280-67225-7	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V506	280-67225-8	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V507	280-67225-9	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V508	280-67225-10	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V509	280-67225-11	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310
J1V510	280-67225-12	6010/7471/8082/WTPH-D+/8310	6010B/7471A/8082/NWTPH-Dx/8310

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 4/1/2015 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 2.1° C, 3.3° C and 4.1° C.

The samples presented in this report contained large rocks that were not included in the aliquots used for extraction and/or analysis.

GC SEMIVOLATILES - SW846 8082 - PCBs

The laboratory noted that a Sulfuric Acid clean-up was performed on the samples presented in this report to reduce matrix interferences.

Sample J1V506 contained a combination of Aroclor 1254 and Aroclor 1260 with insufficient separation to quantify individually. The sample has been quantified and reported as the predominant Aroclor. Due to the shared peaks of these two Aroclors, there is increased qualitative and quantitative uncertainty associated with these results.

No other anomalies were encountered.

GC SEMIVOLATILES - NWTPH-Dx - DRO

No anomalies were encountered.

HPLC - SW846 8310 - PAHs

The RPD between the primary and confirmation columns exceeded 40% for Benzo[a]anthracene in samples J1V4X9, J1V501, J1V502 and J1V506. The lower of the two values has been reported, as matrix interference is evident on both columns. Associated results have been flagged with an "X".

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-270827 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

Low levels of Chromium are present in the method blank associated with batch 280-270827. Because the concentration in the method blank is not present at a level greater than half the reporting limit, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V4X9; therefore, control limits are not applicable.

The duplicate analysis of sample J1V4X9 exhibited RPD data outside the control limits for Barium, Boron and Mercury, and the associated sample results have been flagged "M". There is no indication that the analytical systems were operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

Washington	Closure Hanfo	rd CHA	IN OF CUST	ODY/S	AMPL	EANA	LYSI	S REQUES	RC-232-091	
ollector		Company	y Contact Kessner	Tele	phone No. 4688			Project Coordinator KESSNER, JH	Price Code	Data Turnaround
STOWE, QG Project Designation		Sampling	Location			-		SAF No. RC-232	83	7 days
100-IU-2 & 100-IU-6 Ren	naining Waste Sites		3-35:1 (shallow zone, v abook No.		OA.			Method of Shipment		
ce Chest No.	08-022		67-03		010B3520	00	84. 3	The state of the s	x3 600 7 x	
Shipped To		Offsite P	roperty No. 13	3139-	l .	ru)		Bill of Lading/Air Bill N	2 8	
TestAmerica Denv	er			7107-	3		7.			
Other Labs Shipped To			Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 40			
			Type of Container	G/P	aG `	æG	aG			
POSSIBLE SAMPLE HA	ZARDS/REMARKS		No. of Container(s)	11	1 %	1	1			
V/A			Volume	250mL	250mL	125mL	250mL		280-67225 Chain of Cust	
						784	Same.		280-6/225 Criain of Gua.	
Special Handling and/o	or Storage		Sample Analysis	See item (1) in Special	PCBs - 8082	TPH-Diesel Range -	PAHs - 8	310		
Cool 4C			Satthie Atlantais	Instructions		WTPH-D+	27	1 -5-71		
ğ			Sample Time	MATERIAL STATES			at the said	以表达公司	mai se casa sa	
Sample No.	Matrix	Sample Date			X.	×'	X	A STATE OF THE STA		82 K. J. J. J. K.
eXk/R	SOIL	<u>03 30 15</u>	0950	12.	×	x.	×			
J1V500	SOIL	03/30/15 03/30/15		12.	~	χ.	1×			
J5V501	10. 10. 10. 10. 10. 10. 10. 10. 10. 10.	03/30/15	0902	×	7	X.	×			
J1V502 J1V503	SOIL	03/30/15		×	~	X	人			
	POSSESSION	可以把证证	Sign/Print Names		SPEC	IAL INSTR	UCTION	S	Autinomy Americ Rarker	n Bervilium Boron Cadmium.
Refinquished By/Removed Fron	Date/Time 1125	and the second s		1125					i, Antimony, Arsenic, Bartun ignesium, Manganese, Mol Mercury - 7471 - (CV) (Mer	n, Beryllium, Boron, Cadmium, ybdenum, Nickel, Potassium, rcury)
Relinquished By/Removed From		December Bulling	neele Marin		Sele	mum, Silicon	, Saver, So	outen, vandonen, esoj.		
ant stantame	71/05/15 canif	China	allo C / A Dath/1895	Color Page			1, 1, 1, 16			
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Relinquished By/Removed From	n Date/Time	Received By/Ston	Date I in	IAPT/D					\3	31 15/
Relinquished By/Removed Fro	m Date/Time	Received By/Stor								
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FINAL SAMPLE Disposal	Method	Dispo	sed By Date	e/Time		UF	000			
DISPOSITION				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	·					

Washington C	logure Hanf	ord CH	AIN OF CUST	ODYIS	AMPL	E ANA	LYS	S REQUE	ST	RC-2	232-091	Page 2	2 of 3
ollector	NOSUIC HAIN		ny Contact	Tele	phone No. Proj			Project Coordinate	or	Price Code		Data T	umaroun
STOWE, QG roject Designation			n Kessner ng Location	375	375-4688			KESSNER, JI SAF No.	1			, d	
100-IU-2 & 100-IU-6 Rema	aining Waste Sites		-B-35:1 (shallow zone, v	er)				RC-232		8.8		1 6	days
RCC-08-022 Field Logbook No. EL-1667-03					010B352	000		Method of Shipme Commercial C	int Carrier	Fed (٤,		
hipped To		Offsite	Property No.	1397				Bill of Lading/Air		OSEC			
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			Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 40				T. in		
N/A			Type of Container	G/P	aG	aG	aG						
OSSIBLE SAMPLE HAZ	ARDS/REMARKS		No. of Container(s)	1	1	140	1		H	7			
/A			Volume	250mL	250mL	125mL	250ml		3				
							30 %			- 7			
Special Handling and/or	Storage		Sample Analysis	See item (1) in Special Instructions	PC8s - 8082	TPH-Diesel Range - WTPH-D +	PAHs-8	310					
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FINAL SAMPLE DISPOSITION	sthod	Dispo	beed By Date/	i me	*	JP	U304	t [, ;					

Washington (Closure Hanfo	ord CHA	AIN OF CUST	ODY/S	AMPL	E ANA	LYSI	SKEQU	ESI		232-091		
ollector		Compar	ny: Contact		phone No. ; -4688			Project Coordin KESSNER,		Price Code		Data 7	นเมษายนแก
STOWE, QG oject Designation			n Kessner ng Location		1000			SAF No.		88		7	zyok
100-JU-2 & 100-JU-6 Rem	naining Waste Sites	100-	B-35:1 (shallow zone, ve			Y to the second		RC-232 Method of Ship	ment	ررو			marto
e Chest No.		all your of all the sales and the sales	ogbook No. 1667-03		010B352	000		Commercia	Carrier	1 Fred	Ex	* * * * -	
hipped To	-08-022	Offsite	Property No.	207	L			Bill of Lading!A	ir Bill No.	مود		7,24	18 5
TestAmerica Denve	∍r		#131	397									
ther Labs Shipped To			Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C						
010			Type of Container	G/P	aG	aG ·	aG				11 0 18 0 07 Mg		
POSSIBLE SAMPLE HA	ZADDS/DEMARKS		No. of Container(s)		1	7	1						
VA			Volume	250mL	250mL	125mL	250mL				1.23		
			ARREST AND ARRESTS		130		711				1434		
Special Handling and/o	r Storage			See item (1) ir		TPH-Dieboi					14.5		1
Cool 4C			Sample Analysis	Special Instructions	PCBs - 8082	Range - WTPH-D +	PAHs - 83	310	12 13			HIE .	100
D D								州山鱼					a managa
Sample No.	Matrix Matrix	Sample Date	Sample Time			SIERRA			20.00		10000	LE CHANGE	NAME OF THE OWNER, OWNE
edva	SOIL	03/30/15	0915	17.	×	×	X	- 4 (4)		3 2 3 3 3 3	33%	Unit	
JTV510	SOIL	03/30/15	0922	XI	×	X	X-						
5							0/14	\$38 C.W.		+	10 Maria	10000	
					43. 790	Version ser							
					leps	CIAL INSTR	PUCTIONS	S		<u> </u>	44 1835		
CHAIN OF F Refinquished By/Removed From	POSSESSION //2	Received By/Ston	Sign/Print Names od in 3/30/15 Date/Time	1185			004070 (0	lose-out List) (Al , Copper, Iron, L	uminum, Ar	timony, Arser	ic, Barium, Ber	ryllium, Boron	Cadmium,
aniney stone i	2-3-30-15	1-4-07	some Vosen	14 e	Cal Sel	enium, Chromi enium, Silicor	n, Silver, Sc	odium, Vanadium	, Zinc); Me	rcury - 7471 -	(CV) (Mercury)		
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Relinquished By/Removed From FINAL SAMPLE Disposal	Method	Diep	osed By Date	/Time		TPO	Oni	1				1.53	

Appendix 5

Data Validation Supporting Documentation

VALIDATION LEVEL:	A	В	(c)	D	E
PROJECT:	00-B-35	; (DATA PACKAC	BE: J\$ 0939	f
VALIDATOR:	ELR	LAB:	4(DATE: U	52/11
			SDG:	P0934	
		ANALYSES	PERFORMED		
8015	8021	8141	8151	8315	(8310)
		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MAT	RIX:				
JIVYKE	JIVSOO	210501	alnzas	JIUSUJ .	11 vs04
J14505		Jluson		710200	71 N210
				VE	Yes No W/A
Initial calibrations Continuing calibra Standards traceabl Standards expired Calculation check	ations acceptable? e? ? acceptable?				\ /

BLANKS (Levels B, C, D, and E)		Δ
Calibration blanks analyzed? (Levels D, E)		Yes No (\$774)
Laboratory blanks analyzed?		No N/A
ACCURACY (Levels C, D, and E) rrogates/system monitoring compound recoveries acceptable? rrogates traceable? (Levels D, E) rrogates traceable? (Levels D, E) rrogates expired? (Levels D, E) rrogates expired? (Levels D, E) rrogates analyzed?		No N/A
rrogates/system monitoring compounds analyzed? rrogate/system monitoring compound recoveries acceptable? rrogates traceable? (Levels D, E) rrogates expired? (Levels D, E) S/MSD samples analyzed? S/MSD results acceptable? S/MSD standards NIST traceable? (Levels D, E) S/MSD standards expired? (Levels D, E)		Yes('Ng)
Field/trip blank results acceptable? (Levels C, D, E)		Yes No
Transcription/calculation errors? (Levels D, E)		Yes No N/A
Comments:	n. Fn	
•		
Surrogate/system monitoring compound recoveries acce	eptable?	Yes No N/A
MS/MSD results acceptable?		
MS/MSD standards expired? (Levels D, E)	••••••	
LCS/BSS samples analyzed?		
LCS/BSS results acceptable?		
Standards traceable? (Levels D, E)		Yes No NA
Standards expired? (Levels D, E)		Yes No N/A
Transcription/calculation errors? (Levels D, E)		Yes No WA
Performance audit sample(s) analyzed?		
Performance audit sample results acceptable?		Yes No N/A
Comments:		
	No B	K

5.	PRECISION (Levels C, D, and E)			
Dupli	cate RPD values acceptable?	(No	N/A
Dupli	cate results acceptable?	Yes	No	N/A
MS/M	ISD standards NIST traceable? (Levels D, E)	Yes	NO) HA
MS/M	ASD standards expired? (Levels D, E)	Yes	No	WA
Field	duplicate RPD values acceptable?	Yes	No(W.
Field	split RPD values acceptable?	Yes	No (NA
Trans	cription/calculation errors? (Levels D, E)	Yes	No (N/A
Comn	nents:			
-				
6.	HOLDING TIMES (all levels)			
Samp	les properly preserved?	(/Yes)	No	N/A
				N/A
Comr	ments:			
	Λ			
				
				
~				

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS	(an	
levels)	/-	7
Results reported for all requested analyses?		> ₩<
Results supported in the raw data? (Levels D, E)		\sim
Samples properly prepared? (Levels D, E)	Yes	No WA
Detection limits meet RDL?		
Transcription/calculation errors? (Levels D, E)	Yes	No(N/A)
Comments:		
	<u> </u>	
		$\overline{}$
9. SAMPLE CLEANUP (Levels D and E)		//\
Fluoricil ® (or other aborbant) cleanup performed?	Yes	No N/A
Lot check performed?	Yes	No N/A
Check recoveries aceptable?	Yes	Nd N/A
Check materials traceable?	Yes	Nø N/A
Check materials Expired?	Yes	No N/A
Analytical batch QC given similar cleanup?	Yes	No N/A
Transcription/Calculation Errors?		
Comments:		$\overline{}$

Appendix 6

Additional Documentation Requested by Client

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Method Blank - Batch: 280-270855

Method: 8310 Preparation: 3550C

Lab Sample ID: Client Matrix:

Solid

MB 280-270855/1-A

Analysis Batch: Prep Batch:

280-271012 280-270855

Instrument ID: Lab File ID:

CHHPLC_G G0403006.D

Dilution:

1.0 04/03/2015 1106

N/A

Leach Batch: Units:

N/A ug/Kg Initial Weight/Volume: Final Weight/Volume:

31.3 g 4 mL

Analysis Date: Prep Date: Leach Date:

04/02/2015 1623

Injection Volume: Column ID:

20 uL PRIMARY

Analyte	Result	Qual	MDL	RL
Acenaphthene	9.6	U	9.6	96
Acenaphthylene	8.6	U	8.6	96
Anthracene	2.9	U	2.9	19
Benzo[a]anthracene	3.1	U	3.1	14
Benzo[a]pyrene	6.1	U	6.1	14
Benzo[b]fluoranthene	4.0	, υ	4.0	14
Benzo[g,h,i]perylene	6.9	υ	6.9	29
Benzo[k]fluoranthene	3.8	U	3.8	14
Chrysene	4.6	U	4.6	38
Dibenzo(a,h)anthracene	11	U	11	29
Fluoranthene	12	U	12	38
Fluorene	5.1	U	5.1	29
Indeno[1,2,3-cd]pyrene	12	U	12	29
Naphthalene	12	U	12	96
Phenanthrene	12	U	12	38
Pyrene	12	U	12	38
Surrogate	% Rec		Acceptance Limits	

Terphenyl-d14 (SUR)

91

72 - 115

Job Number: 280-67225-1

Sdg Number: JP0934

Lab Control Sample - Batch: 280-270855

Client: Washington Closure Hanford

Method: 8310 Preparation: 3550C

Lab Sample ID: Client Matrix:

LCS 280-270855/2-A Solid Analysis Batch: Prep Batch: Leach Batch:

Units:

280-271012 280-270855 Instrument ID: Lab File ID: CHHPLC_G G0403007.D 31.5 g

Dilution: Analysis Date: Prep Date: 1.0 04/03/2015 1137 04/02/2015 1623 N/A ug/Kg Initial Weight/Volume: Final Weight/Volume: Injection Volume:

4 mL 20 uL

Leach Date:

N/A

Column ID:

e: 20 UL PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acenaphthene	1900	1650	87	75 - 116	
Acenaphthylene	1900	1630	86	66 - 115	
Acenaphinyene Anthracene	1900	1610	85	71 - 115	
	1900	1770	93	77 - 120	
Benzo[a]anthracene	1900	1770	93	69 - 115	
Benzo[a]pyrene	1900	1730	91	56 - 115	
Benzo[b]fluoranthene	1900	1960	103	72 - 120	
Benzo[g,h,i]perylene	1900	1790	94	76 - 115	
Benzo[k]fluoranthene	1900	1730	91	79 - 115	
Chrysene	1900	1700	89	72 - 115	
Dibenzo(a,h)anthracene	1900	1750	92	77 - 115	
Fluoranthene 	1900	1730	91	77 - 115	
Fluorene	1900	1740	91	78 - 115	
Indeno[1,2,3-cd]pyrene	1900	1560	82	68 - 120	
Naphthalene	1900	1650	86	75 - 115	
Phenanthrene		1850	97	72 - 115	
Pyrene	1900	1030	- '		
Surrogate	%	Rec	F	Acceptance Limits	

Terphenyl-d14 (SUR)

92

72 - 115

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Matrix Spike/

Method: 8310

Matrix Spike Dupi	icate Recovery Repor	t - Batch: 2	280-270855		Prepara	ation: 3550C		
MS Lab Sample ID: Client Matrix: Dilution: Analysis Date: Prep Date: Leach Date:	280-67225-2 Solid 1.0 04/03/2015 1309 04/02/2015 1623 N/A	Pre	alysis Batch: ep Batch: ach Batch:	280-271012 280-270855 N/A	Final We	ID: eight/Volume: eight/Volume: Volume:	CHHPLC_0 G0403010. 30.6 g 4 mL 20 uL PRIMARY	
MSD Lab Sample ID Client Matrix: Dilution: Analysis Date: Prep Date: Leach Date:	: 280-67225-2 Solid 1.0 04/03/2015 1339 04/02/2015 1623 N/A	Pre	alysis Batch: ep Batch: ach Batch:	280-271012 280-270855 N/A	Final We	ID: eight/Volume: eight/Volume: Volume:	CHHPLC_0 G0403011. 30.5 g 4 mL 20 uL PRIMARY	
Analyte		<u>9</u> MS	<u>6 Rec.</u> MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Acenaphthene		84	87	75 - 116	3	20	***************************************	
Acenaphthylene		83	85	66 - 115	3	20		
Anthracene		83	85	71 - 115	3	20		
Benzo[a]anthracene		91	93	77 - 120	2	20		
Benzo[a]pyrene		92	94	69 - 115	2	20		
Benzo[b]fluoranthene		89	91	56 - 115	2	20		
Benzo[g,h,i]perylene		102	104	72 - 120	2	20		
Benzo[k]fluoranthene	9	93	94	76 - 115	2	20		
Chrysene		90	91	79 - 115	2	20		
Dibenzo(a,h)anthrac	ene	88	90	72 - 115	2	20		
Fluoranthene		90	92	77 - 115	2	20		
Fluorene		88	90	77 - 115	3	20		
Indeno[1,2,3-cd]pyre	ne	90	91	78 - 115	2	20		
Naphthalene		80	82	68 - 120	3	20		
Phenanthrene		84	87	75 - 115	4	20		
Pyrene		95	97	72 - 115	2	20		
Surrogate			MS % Rec	MSD %	6 Rec	Aco	eptance Limits	
Terphenyl-d14 (SUR)		89	92		7	72 - 115	

Client: Washington Closure Hanford

Job Number: 280-67225-1

Sdg Number: JP0934

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 280-270855

Method: 8310

Preparation: 3550C

MS Lab Sample ID:

280-67225-2

MSD Lab Sample ID:

280-67225-2

Client Matrix:

Solid

Client Matrix:

Solid

Dilution:

1.0

Dilution:

1.0

Analysis Date:

04/03/2015 1309

Analysis Date:

04/03/2015 1339

Prep Date: Leach Date: 04/02/2015 1623 N/A

Prep Date:

04/02/2015 1623

Leach Date:

NIA

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Acenaphthene	10	U	2050	2050	1730	1780
Acenaphthylene	9.1	Ú	2050	2050	1690	1740
Anthracene	3.1	Ü.	2050	2050	1690	1750
Benzo[a]anthracene	3.2	Ü	2050	2050	1870	1910
Benzo[a]pyrene	6.5	U	2050	2050	1890	1930
Benzo[b]fluoranthene	4.2	U	2050	2050	1830	1870
Benzo[g,h,i]perylene	7.2	U	2050	2050	2080	2130
Benzo(k)fluoranthene	4.0	U	2050	2050	1900	1930
Chrysene	4.9	U	2050	2050	1830	1870
Dibenzo(a,h)anthracene	11	U	2050	2050	1810	1840
Fluoranthene	13	U	2050	2050	1850	1890
Fluorene	5.3	U	2050	2050	1790	1850
Indeno[1,2,3-cd]pyrene	12	U	2050	2050	1840	1870
Naphthalene	12	U	2050	2050	1640	1690
Phenanthrene	12	υ	2050	2050	1720	1780
Pyrene	12	U	2050	2050	1950	1990

Units: ug/Kg